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No. I. OF VOL. II., 1927. **No. 5418. Vol. CCXIII.** LONDON, SATURDAY, JULY 2, 1927 Founded 1823. Registered as a Newspaper. Published Weekly. **Pp. 120—Price 1s.** Annual Subscription. Inland £2 2s. Abroad £2 10s.

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on Visceroptosis. By A. J. WALTON, M.S., F.R.C.S. — (*Illustrated*) 1

AN ADDRESS on the Law and Ethics of Medical Confidences. By LORD RIDDELL 4

ORIGINAL ARTICLES.

Colour Tests for Vitamin A. Their Application to Naturally Occurring Products. By STANLEY G. WILLIMOTT, Ph.D., B.Sc., and FRANK WOKES, B.Sc., F.I.C. 8

Streptococcal Septicæmia. By W. SANDERSON, M.B., Ch.B., NORMAN B. CAPON, M.D., and HENRY H. MACWILLIAM, M.B., D.P.H.—(*Illustrated*) 12

CLINICAL AND LABORATORY NOTES.

Infection of the Nasal Sinuses in Relation to Insanity. By J. GAY FRENCH, M.S., F.R.C.S. 13

Hypertrophy of the Papilla Foliata in Man. By B. T. ROSE, Ch.M., F.R.C.S. .. 14

REVIEWS AND NOTICES OF BOOKS.

The Conservation of the Family. By Paul Popenoe 20

Food and the Principles of Dietetics. By Robert Hutchison, M.D., F.R.C.P. 21

An Introduction to Forensic Psychiatry in the Criminal Courts. By W. Norwood East, M.D. 21

Diseases of Infants and Children. By J. P. Crozer Griffith, M.D., and A. Graeme Mitchell, M.D.... 21

Modern Practice of Pediatrics. By Prof. W. P. Lucas, M.D..... 21

A Text-book of Bacteriology for Dental Students. By Arthur Bulleid, M.R.C.S., L.D.S. 22

MEDICAL SOCIETIES.

Medico-Legal Society: The Law and Ethics of Modern Confidences 14

North of England Obstetrical and Gynæcological Society 18

LEADING ARTICLES.

PROFESSIONAL SECRECY ... 23

PUBLIC HEALTH IN SCOTLAND 23

SMOKE ABATEMENT 24

ANNOTATIONS.

Optician and Ophthalmic Surgeon 26

The Hunterian Museum.... 26

A Syringe for Blood Transfusion 27

Medicine on a Modern Liner 27

The Danger of Irradiating Milk..... 28

Orthopædic Softening of Bones 28

An Opportunity for Pharmacists 28

The Stephen Paget Memorial Lecture 29

Ethylene and Carbon Monoxide 29

Good and Bad Mating 29

The Trade Disputes Bill.... 30

MODERN TECHNIQUE IN TREATMENT.

CCXXX.—Malignant Disease of the Uterus. I. General Considerations. By VICTOR BONNEY, M.S., M.D. 31

NEW INVENTIONS.

A Simple Method of Blood Transfusion (R. R. Macintosh, M.R.C.S.). —(*Illustrated*) 22

A Device for Cutting Plaster of Paris Splints (A. F. Da Costa, L.M.S.)—(*Illustrated*) 22

INDEX NOTICE.

THE LANCET, Vol. I., 1927 . 30

SPECIAL ARTICLES.

Royal College of Surgeons of England: Position of the Members.—Explanatory Statement by the Council of the College.—Replies of the Society of Members 32

Association of American Physicians. Annual Meeting..... 17

Medicine and the Law: Limitations on Unrestricted Publicity of Judicial Proceedings..... 35

The Health of London in 1926: Housing.—Birth- and Death-rates 36

National Physical Laboratory: A Reception at Teddington 37

British Hospitals Association Conference: Relationship between Voluntary Hospitals and the State 38

Ireland: A Cancer Campaign 43

Infectious Disease in England and Wales 39

THE SERVICES.

Royal Naval Medical Service. —Royal Army Medical Corps.— Indian Medical Service 39

CORRESPONDENCE.

University of London: Appeal for Sports Ground and Boat-house..... 40

The Persistence of the Slum (Dr. A. S. M. Macgregor). 40

The Distribution of Lead Colloids (Prof. W. Blair Bell) 41

Meckel's Diverticulum (Dr. E. H. R. Altounyan).... 41

Diphtheria in London (Dr. Thomas Maben) 41

Impetigo Contagiosa (Dr. H. P. Cholmeley)..... 42

Quinine and Chinosol Suppositories 42

Anæsthetics and Inquests (Dr. J. Henry Chaldecott) 42

An Unusual Case of Foreign Body (Dr. R. L. Wason) 52

Wanted—An Explanation (Dr. A. T. Schofield)..... 52

MEDICAL NEWS.

Univ. of Cambridge..... 44

Soc. of Apothecaries..... 44

Univ. of Glasgow..... 44

University of London..... 25

Birmingham Hospital Saturday Fund 25

Fellowship of Medicine, &c. 30

Bristol's Mental Defectives. 39

Royal Medico-Psychological Association..... 43

Harveian Society..... 44

St. John's Hosp. Dermatological Soc..... 44

Epsom College..... 44

St. Thomas's Hosp. Memorial 44

Wirral Convalescent Home 44

Redcar Hospital..... 45

Seamen's Dreadnought Hosp. 45

Middlesbrough Hospitals... 45

Dewsbury Infirmary..... 45

Swansea Hospital..... 4

St. John of Jerusalem..... 45

Donations and Bequests.... 45

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Landlord and Tenant Bill. —Midwives and Maternity Homes (Scotland) Bill.—Poor-law Administration in West Ham.—Patent Medicines Duty..... 45

House of Commons: Training of Midwives in Scotland.—Infantile Mortality in London Boroughs. — Deaths of Women in Childbirth.—Slum Clearances and Playing Fields.—Schools for Mentally Defective Children.—Sickness among British Troops in China 47

NOTES, COMMENTS, AND ABSTRACTS.

The Bottle of Medicine. By W. THOMSON BROWN, M.C., M.B..... 50

Orthopædic Nursing 52

Clinical Pathology and the Use of Stains 52

Home-grown Cheese 52

Medical Diary..... 49

Appointments 49

Vacancies 49

Births, Marriages, Deaths.. 50

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An Address
ON
VISCEROPTOSIS.

A Contribution to the Discussion at the Meeting of the Association of Surgeons at Glasgow on May 5th, 1927.

BY A. J. WALTON, M.S. LOND., F.R.C.S. ENG.,
SURGEON TO THE LONDON HOSPITAL.

WITH the spread of civilisation and the improvement in medical knowledge and surgical technique certain diseases tend to disappear, but there are others which are found with increasing frequency and which, indeed, appear to be directly dependent upon the conditions of civilised life. Such a disease is that curious group of symptoms and pathological changes which is spoken of as "visceroptosis"—a name admittedly incomplete, as it only describes one of the many changes. Some 20 or 30 years ago these patients were rarely seen, but to-day they form a large and important section of any abdominal clinic; important in that their symptoms closely resemble those of recognised organic lesions, and that preventive and curative treatment leaves at present much to be desired.

To a certain extent the changes are unquestionably hereditary, and are thus becoming more common in so far as civilisation permits the survival of those who are partly unfit; but in order to obtain the means to preserve the unfit, civilisation demands harder work on the part of the fit, so that they, and especially those on the border-line, are in turn rapidly becoming unfit. In fact, the burden of keeping the unfit is becoming more than the fit can bear. Thus, in ptotic patients environment plays a considerable part in that the stress of life under modern conditions is responsible, especially in women, for many of the changes, and it is, as I hope to show, the combination of the congenital and acquired faults which causes the characteristic symptoms. The pathological changes are widespread, and it is only of recent years that they have been recognised as part of one disease. It will be convenient for descriptive purposes to consider them under the following heads: abnormal mobility and dilatation of the intestines; the presence of accessory membranes; changes in the body structure; altered mentality.

ABNORMAL MOBILITY AND DILATATION OF INTESTINES.

Every case presenting the characteristic symptoms of visceroptosis will, on physical examination or on X ray investigation, show an abnormal mobility of some part of the intestinal tract, but the investigation of this factor is one which is associated with considerable difficulty. There is no true standard of the position and mobility of the portions of the intestinal tract, and it has been shown by many observers that there is a considerable variation in these respects without the presence of any abnormal symptoms. This is especially so in females. McConnell and Hardman, for instance, found that in a series of apparently normal individuals the cæcum and ascending colon were considerably lower in females than in males, but there was also a considerable variation in different individuals. Quain examined 25 nurses with the X rays who had normal gastro-intestinal function; more than half of them had an abnormally low right colon; in two who had never had constipation the hepatic flexure was near the anterior superior spine. But although all persons who have prolapsed stomachs and colons, as found by X ray examination, may not have symptoms, all those who have symptoms are found to have prolapsed and dilated stomachs and colons. The liver is prolapsed, being rotated down to the right rather than directly dropped. The kidneys, and especially the right, are abnormally mobile and frequently dropped. In women the uterus is nearly always retroverted and is frequently prolapsed. The abnormal mobility of the large intestine is in nearly all cases associated with the presence of a mesentery in those areas which normally should have no posterior peritoneal covering. For instance, the duodenum and the cæcum can often be freely withdrawn from an abdominal wound owing to the presence of such a mesentery.

Abnormal dilatation of portions of the intestinal tract is of considerable interest. All cases of true ptosis show dilatation of the stomach or intestine, but unless there is some additional obstructive factor there is never any hypertrophy of the muscular wall. Many adults of both sexes who have reached middle age and are overworked show atony and dilatation of portions of the intestine or of the stomach which causes an acquired ptosis, but such conditions are usually temporary and react well to treatment, so that it is doubtful if they should be regarded as cases of ptosis. Barclay has laid special stress on this point in his X ray investigations of the stomach, and draws a sharp line of distinction between acquired atony and true ptosis. Of greater interest are some of the rarer forms of pronounced dilatation of the intestine. Wilkie has drawn attention to the extreme degrees of atonic dilatation of the duodenum which he has designated as duodenal ileus, and has shown how it is frequently associated with visceroptosis, although personally I believe his view that it is due to compression of the duodenum by the drag of the mesentery is incorrect, and that the dilatation is atonic and is part of the general atony of ptosis. Occasionally cases are seen of extreme dilatation of portions of the large intestine in relatively young people who may complain of constipation alone or of attacks of colicky pain, and it becomes difficult to say whether they should be regarded as advanced degrees of ptosis or mild varieties of Hirschsprung's disease. Such a case is represented in the X rays (Figs. 1 and 2). Probably we shall find in the future that there is no very marked difference between the changes found in ptosis and those of idiopathic dilatation of the colon, and that the attacks of severe pain in the former condition may be due to muscular spasm of a similar nature but in a different situation from that causing the changes of Hirschsprung's disease. It is notable, however, that the dilated portions of the intestine practically never show any hypertrophy, and this, even when there appears to be a definite obstruction. Thus, in my experience, in duodenal ileus the wall is never thickened, as would be expected with obstruction from the mesentery, and the colon in this respect shows a clear distinction from that of Hirschsprung's disease.

THE PRESENCE OF ACCESSORY MEMBRANES.

The characters of the accessory membranes which are present in these cases have been so frequently described that they need only be briefly mentioned here. Passing from above downwards there is frequently found a filamentous membrane running from the duodenum to the gall-bladder, the so-called cystico-duodenal fold. There are similar bands from the first part of the jejunum to the under surface of the mesocolon, the mesocolic bands. There is a band often more dense and fibrous than the others passing from the antimesenteric border of the ileum, about 2–6 inches from the ileocæcal valve, along the under-surface of the mesentery to the posterior abdominal wall which gives rise to the well-known Lane's kink. Passing from the right side of the abdominal wall across the cæcum and ascending colon is a membrane of very varying degree known as Jackson's membrane. In the less advanced cases it is present only as a small band across the cæcum and involving an atrophic appendix, while in the more advanced degrees it forms a wide curtain, often continuous above with the gall-bladder and hepatic flexure, when it is known as the cystico- or hepatico-colic fold. In the middle portion it runs right over the ascending colon, and may even fuse this portion of the intestine with the commencement of the transverse colon, in which case

it is clearly a continuation of the great omentum, while below it enfolds the cæcum in a thin and voluminous bag. Similar membranes are found at the splenic flexure running from the termination of the transverse colon to the commencement of the descending colon, so that these two portions of the intestine lie parallel and are fixed above to the spleen, these membranes being spoken of as Payr's membranes. In the loop of the pelvic colon there is on the outer side a dense white membrane superimposed on the mesocolon which draws the loop of the pelvic colon down to the iliac fossa. So common is this membrane that it very frequently has to be divided in performing the operation of colostomy. If it is incised the mesocolon is found to be in a normal condition beneath it, and the colon can often be withdrawn a further 1 inch or 2 inches. This membrane, which is the cause of Lane's so-called first and last kink, is generally spoken of as a Toldt's membrane. These membranes are unquestionably congenital in origin, for not only have they been found at birth and in quite young children, but they are entirely different in their characters from any inflammatory changes.

I think the majority of surgeons would agree to-day that there is little or no evidence that they are formed as the result of chronic intestinal stasis, as Lane described, or that they are the result of a low form of inflammation, as Adami believed, and as many other writers have suggested from time to time. Coffey believes that all these factors come into play and that some of the membranes are congenital and represent anomalous fœtal developments, whereas others are inflammatory and the widespread membranes arise as Lane has described. My own experience has strongly favoured the view of their congenital origin, for it will be seen that among my cases which have been subjected to operation 22 were young people under the age of 20, in whom these acquired factors could hardly have been at work. Some degree of accessory membrane formation is extremely common, and in fact in over 50 per cent. of women they may be found in some form or other. It is only when they are present to an excessive degree that they can be regarded as pathological. It is also becoming evident as one is gaining wider experience that there is a definite hereditary factor in these cases, a high percentage of girls with virginal ptosis having mothers who have suffered from the same condition.

FIG. 1.

C = Cap. U = Umbilicus. A = Appendix.

FIG. 2.

Marked dilatation of colon with general ptosis in a boy aged 18.

CHANGES IN BODY STRUCTURE.

In many patients with well-developed virginal ptosis there are very definite changes in the general body structure. It is, however, a fact to which attention has been directed on several occasions, that all the symptoms and intestinal changes of virginal ptosis may appear in women who do not present these body changes, and who, indeed, appear to be strong, muscular, healthy girls. When changes are present they first appear after puberty and are well established between the ages of 20 and 30. They have had special attention directed to them by the work of Goldthwaite, Martin, Smith, Rovsing, and others, who have also pointed out the importance of the hereditary factor. It was their work which first differentiated between the virginal and maternal types, but it is with the first of these types alone that I shall have to deal to-day. Such patients are relatively frail, thin, and often, indeed, wasted. They may be tall, although otherwise they are poorly developed. The dorsal spine is curved forwards and there is an absence of the normal lumbar curve. The shoulders are drooped and prominent, the thorax narrow antero-posteriorly and very much narrowed from side to side below, so that there is a long, narrow, epigastric angle. When standing erect the upper abdomen is flattened and the lower protruberant and flabby. The narrowness of the abdomen and the lower thorax gives a curious picture, as though the patient had a pelvis which was too big for her body. It is

also the narrowing of the lower thorax which to a large extent gives rise to the displacement of the abdominal viscera, for in a well-established case it is evident that the viscera could not be replaced owing to this narrowness. In addition to this, there is very often general muscular weakness, and there may be a certain amount of genu valgum or flat-foot.

With such a body-change the hereditary influence is often strongly in evidence. Briggs has worked out a series of 128 members of 23 families all descended from a veteran of the American Civil War. Of the 128 members, 64 were affected with ptosis, thus agreeing with the Mendelian principles. Rovsing has shown, however, that similar changes may be due to external interference with normal development, which will not begin to be active until after the onset of puberty. The fact that some patients with symptoms of visceroptosis do not show these changes, but are well-developed, muscular girls, while others show a marked "ptosis habitus" was for a time difficult to understand, but has been made clear by Sherrington's work, which has shown that voluntary muscular movements are quite distinct from those of postural activity, and may indeed possibly be carried out by separate muscular fibres. Thus it is that patients who have strong and well-developed voluntary muscles may have a poor postural tone, and it is indeed noticeable to-day that many girl athletes with a well-developed bony frame and muscles have an extremely poor stance and hold their bodies very badly. It is also probable that girls who are occasionally seen with a marked "ptosis habitus" and no symptoms have, in spite of their deformity, developed good postural tone.

CHANGES IN MENTALITY.

In the advanced stages these patients usually show an abnormal mentality which is one of the chief obstacles to satisfactory treatment. Their outlook on life is miserable and despondent, their whole attention being concentrated upon their symptoms. For this reason their response to treatment is difficult to estimate, for even if relieved of their abdominal symptoms they complain of difficulties elsewhere. Their symptoms, in fact, develop a very definite functional or hysterical basis. Although they are despondent and miserable, they rarely become suicidal, and it is also noticeable that although they expend a great deal of energy in seeking advice, they rarely have sufficient application to follow the lines of treatment that are given to them. It is difficult to determine what is the relationship of these mental changes to the original disease, for it is possible that any patient subjected to long-continued physical pain would develop such a mentality, but on the other hand, as Bankart has pointed out, it may be congenital poor mentality of this sort which is so largely responsible for the absence of postural tone. Postural activity is acquired in early life, a good body position being only maintained at first by irksome voluntary effort which later becomes unconscious and reflex. A man of poor postural tone who is drilled in the army at first finds it extremely difficult to develop a correct posture, but after a time it is maintained without thought or apparent effort. A patient with the poor mentality above described is just such a one who would be unable or unwilling to go through the irksome early stages of obtaining postural activity. Mental fatigue would arise early, and prolonged effort would be impossible. A poor mentality is probably, therefore, part of the inherited disability.

ÆTIOLOGY.

Virginal ptosis is a condition which is much more common in women. In my own series of 441 cases, 340 were found in women, and even these figures are probably not sufficiently high, for the typical clinical case where the symptoms begin in relatively early life and persist for many years is found almost wholly in women, although among some of the more poorly-developed younger men of to-day there is found the characteristic body structure and early and long-persistent symptoms which are so characteristic in the female. The majority, however, of men in whom ptosis, and only ptosis, is found at operation are patients who have a normal body structure and who have not developed any symptoms until considerably later in life. Thus, the age-incidence of the individual patients among women was as follows:—

10–20 .. 22	30–40 .. 108	50–60 .. 89
20–30 .. 66	40–50 .. 87	60–70 .. 18

A large number of them thus having sought advice between 20 and 40, and only 37 per cent. of them being between the ages of 40 and 60. In the males, on the other hand, no cases were seen under 20, and 50 per cent. of them were between 40 and 60, the actual figures being:—

20–30 .. 13	40–50 .. 30	60–70 .. 3
30–40 .. 35	50–60 .. 28	

In many of them the onset of symptoms seems to be definitely due to hard work at an age when the body is beginning to tire, and, indeed, men of this age are often unwilling to admit that they cannot work as hard as formerly, and, in order to convince themselves that they can, actually increase their work. Such cases on examination not only show the absence of the general characters of ptosis, but rapidly improve with rest and modification of their work, so that it is doubtful indeed whether they should be included as cases of ptosis, but should not rather be regarded as examples of a temporary atony.

FIG. 3.

Prolonged spasm of transverse colon; operation revealed genera ptosis only.

It is curious that with this very much greater preponderance of the female sex, the condition should often have been regarded as a predisposing factor to the development of gastric and duodenal ulceration, although these lesions are much more common in men. In my own series of 1003 gastric and duodenal ulcers, 761 were males and only 242 females. It is perfectly true that there is often very considerable difficulty in the diagnosis of a case of visceroptosis

from a chronic gastric or duodenal ulcer, but it is relatively uncommon to find the two conditions associated. In my own series there have been 61 patients who have had both ptosis and ulceration; thus, with 1003 gastric ulcers ptosis it is only found in 6·09 per cent. The one type of chronic ulcer which is so frequently found with ptosis and upon which the ptosis unquestionably acts as a predisposing factor is hour-glass stomach, a condition which is limited to the female. In my own 49 cases of hour-glass stomach, visceroptosis was noted as being present in 24. If these and the cases of acute ulceration are deducted from the total it leaves 948 cases of ulcer, 34 of which showed ptosis, a percentage of 3·58. In the same way, if the cases of ptosis are considered, the 441 showed 61 cases of ulcer, a percentage of 13·83. If the 27 cases of hour-glass and acute ulcers with ptosis are deducted from this group also, it leaves 414 cases, with 34 having chronic ulcers, a percentage of 8·21, and this percentage is no higher than would be expected as a mere coincidence.

A consideration of the pathological and ætiological evidence, therefore, makes it clear that the clinical picture of visceroptosis is a combination of several factors. As a congenital fault there is the presence of increased mobility and membrane formation, with possibly a rather poor mentality and a tendency for bad body development. The mobility and membrane formation are seen in so large a proportion of the population that in themselves they can hardly be considered an abnormality, and if present alone will give rise to no symptoms, thus accounting for the fact that membranes and abnormal mobility are often found at operation in apparently healthy people. An inherited mental and physical weakness can, however, only be an accessory factor, otherwise the condition would probably be as common in men as in women, and we must rather look for some error in environment to explain why the symptoms are found three times as commonly in the female. Under modern conditions the training of young girls, and especially the training of their static muscles, is insufficient, and a certain number of them therefore develop a poor postural tone and a bad body structure. Should their intestines show no accessory membrane formation they will develop no symptoms, and this even if, owing to the weakness of the abdominal muscles, there is a profound degree of ptosis. It has long been noted that patients may be seen with an extreme degree of visceral ptosis who yet have no symptoms. This is especially so in the cases of maternal ptosis, where a patient who has had many children in rapid succession may have practically no abdominal wall left. If, however, they have the accessory membranes, symptoms will develop shortly after puberty, when the body changes become evident. It is because women are so much more the subjects of poor postural muscular development that the disease is so much more frequently seen in them than in men. In men the postural muscles are better developed, and symptoms do not appear until there is a loss of tone with the commencing weakness of late middle age. It is necessary not only for the intestines to drop, but they must be irregularly kinked by the bands and membranes which are present as a congenital deformity. There is possibly yet another factor, for no hypertrophy of the muscular coat can be demonstrated proximal to the bands such as would be expected if they were causing a mechanical obstruction. The pain is, however, spasmodic in type, and X ray investigations very frequently show irregular areas of spasm both in the stomach and colon (Fig. 3). The severity of the pain and its spasmodic nature is somewhat alike that found with angina pectoris and certain spasmodic arterial lesions, and is suggestive that it may be due to over-action of the sympathetic supply.

[*The concluding portion of this address dealing with Symptoms and Treatment will appear in our next issue.*]

An Address

ON

THE LAW AND ETHICS OF MEDICAL CONFIDENCES.

Delivered before the Medico-Legal Society on June 23rd, 1927,

BY LORD RIDDELL.

IN both law and ethics medical confidences are regarded as sacred with certain exceptions. The question is what the exceptions are. When may the doctor tell; when should he tell; and when must he tell? On two of these points there is considerable difference of opinion in legal and medical circles.

The rule as to medical secrecy arises out of the fiduciary relationship which exists between the doctor and his patient, analogous to that between solicitor and client. This doctrine of fiduciary relationship dates back to the time of Hippocrates, and has been recognised by the English courts in several cases relating to pecuniary transactions between doctors and their patients (Dent *v.* Bennett [1839] 4 My. and Cr. 48 R.R. 94; Billage *v.* Southee [1852] 9 Ha. 534; Mitchell *v.* Homfray [1881] 8 Q.B.D. 587).

ENGLISH AND SCOTTISH LAW.

In England there is a curious absence of direct authority as to the doctor's liability for failing to keep his patients' affairs secret. This is greatly to the credit of doctors as a race. Had they been unduly communicative to the detriment of their patients no doubt they would have found themselves in the Law Courts. There are, however, analogous cases which show that the courts regard professional secrecy as a grave moral duty which will be enforced, either because disclosure would be a breach of trust and confidence, or because secrecy is an implied term of a contract for professional or confidential services. The duty has been enforced against solicitors; see, for instance, Taylor *v.* Blacklow (1836) 3 Bing N.C. 235; against accountants, see Weld Blundell *v.* Stephens (1920) A.C. 956; and against bankers, see Tournier *v.* National Provincial Bank (1924) 1 K.B. 461. Lord Justice Scrutton's judgment in the latter case contains the following dictum:—

> I have no doubt that it is an implied term of a banker's contract with his customer that the banker shall not disclose the account, or transactions relating thereto, of his customer except in certain circumstances. This duty equally applies in certain other confidential relations, such as counsel or solicitor and client, or doctor and patient. The circumstances in which disclosure is allowed are sometimes difficult to state, especially in the case of a medical man.

The Court refrained from expressing an opinion on the degree of latitude allowed to a doctor in disclosing professional confidences.

In the Duchess of Kingston's case (1776) Lord Mansfield remarked that if a surgeon were voluntarily to reveal medical secrets he would be guilty of a breach of honour, and according to Mr. Justice Vaughan (see Taylor *v.* Blacklow at p. 249) "the law is never better employed than in enforcing the observance of moral duties." Therefore, notwithstanding the absence of direct authority, we are entitled to assume that a doctor would be legally liable for damages sustained by his patient owing to the wrongful disclosure of the patient's confidences.

In Scotland the law is more definite. The case of A. B. *v.* C. D. (1851) 14 D. 177, decided that a doctor might be sued by his patient for a breach of confidence. As this is the only case I can trace in which a medical man has been held liable for a breach of medical confidence it may be well to state the facts. The wife of plaintiff, an Elder of the Established Church, had a child six months after marriage. The kirk session demanded an explanation, including medical testimony. Thereupon plaintiff instructed defendant, a local

doctor, to examine the child and report. Defendant reported in writing that the child had been conceived before marriage, and sent a copy of the report to the minister, who handed it to the kirk session, who treated it as a confession of antenuptial fornication, declined to accept plaintiff's resignation, and ejected him from the kirk. The judges held that there was an implied contract against voluntary disclosure. Lord Fullerton added: "The obligation may not be absolute. It must yield to the demands of justice, if disclosure is demanded in a competent court. It may be modified perhaps if the disclosure is conducive to ends of science—though even there concealment of individuals is usual. But that a medical man, consulted in a matter of delicacy of which the disclosure may be most injurious to the feelings and possibly the pecuniary interests of the patient, can gratuitously and unnecessarily make it the subject of public communication without incurring any imputation beyond what is called a breach of honour, and without liability to a claim for redress in a court of law, is a proposition to which, then thus broadly laid down, I think the court will hardly give their countenance."

In the later case of McEwan *v.* Watson (1905) 12 Scottish Law Times 248 and 599, 13 S.L.T. 340, the House of Lords, on a Scottish appeal, declined to express any opinion as to the right of action. They decided the case on the ground that it could not be actionable to disclose secrets in the witness-box if the practitioner were called as a witness, or even to inform counsel and solicitors of the evidence he was prepared to give.

In some European countries, France and Germany, for instance, the disclosure of medical secrets is a criminal offence. In Germany the rule includes midwives and apothecaries.

The legal position in England may be stated thus, although in some respects not altogether free from doubt:—

1. A doctor, being in a fiduciary capacity, must preserve his patients' confidences unless relieved from the obligation by some lawful excuse.

2. Legal compulsion or the patient's consent are lawful excuses, and the performance of a moral or social duty may also be a justification. Protection of the doctor's interests may also justify disclosure.

3. There is no legal privilege for medical confidences. If called as a witness a doctor must answer such questions as may be put to him by the court.

4. A doctor shares with other citizens the duty to assist in the detection and arrest of a person who has committed a serious crime.

First Proposition.

"A doctor, being in a fiduciary capacity, must preserve his patients' confidences unless relieved from the obligation by some lawful excuse."

This will not be disputed, at any rate on ethical grounds. Every doctor admits that he must preserve his patients' confidences. It is true that the Hippocratic oath is rather hazy. It says: "Whatsoever I shall see or hear in the course of my profession as well as outside my profession in my intercourse with man if it be what should not be published abroad I will never divulge, holding such things to be holy secrets." This amounts to little more than a general declaration against gossiping. The practitioner is left to determine for himself what things in connexion with his profession or not in connexion with his profession "ought not to be spoken abroad." Perhaps an explanation is provided in Hippocrates' Essay on Decorum, in which he warns the practitioner not to gossip to laymen, as gossip may cause criticism of his treatment! But, as stated, the profession recognise that medical confidences are sacred. A breach of the rule may result in serious consequences. Not only may the doctor render himself liable in damages, but he may also be censured by the General Medical Council for unprofessional conduct. It must be confessed that many doctors are not as reticent as they might be. A surgeon who spends his days in removing appendices or gall-stones, or in performing hysterectomies does not perhaps realise that his patients may desire to preserve the secrets of their truncated anatomies. It must be admitted, however, that many patients, as we know to our cost, are proud to descant at large upon their illnesses, and in particular upon their achievements on the operating table. In many cases the doctor is only echoing his patient. Notwithstanding occasional lapses, doctors are entitled to claim with justice that professional confidences regarding vital matters, such as venereal disease, what I may call unofficial pregnancies, attempted abortions, and the like, are rarely divulged. If the doctor gossips he only does so in connexion with matters he regards as immaterial. If he falls from grace he offends through inadvertence or good-humoured loquacity. Perhaps when his offence is pointed out he salves his conscience by the reflection that if he has sometimes been indiscreet, he has, on the other hand, told many lies and exercised many economies of truth to save a patient's reputation. At the same time, if medical advertising were permitted, I am sure that a sign reading "Dr. Blank is a regular oyster. He never talks about his patients," would be a valuable recommendation to the laity. Some doctors think they are entitled to disclose their private patients' secrets to other medical men or to their students. This is a mistake. Medical freemasonry does not justify such disclosures. The symptoms and treatment may be stated, but not the patient's name.

The disposal of doctors' case-books raises an interesting point. Is the doctor entitled to sell them, and what are the responsibilities of the purchaser, and what are those of the doctor's executors? Many years ago I bought a doctor's case-book in a secondhand book shop for sixpence. Evidently it had been sold as waste paper or as part of a library. I suppose, strictly speaking, a doctor or his executors are not entitled to part with his case-books containing professional secrets, and that in strictness the books should be destroyed. But in these days when it has become the practice to dig up the medical histories of the departed, the destruction of the case-books of leading practitioners might rob future generations of much interesting information. Whether these revelations are justifiable is another matter. Evidently they strike a blow at the foundations of medical secrecy.

Second Proposition.

"Legal compulsion or the patient's consent are lawful excuses, and the performance of a moral or social duty may also be a justification."

This proposition raises more difficult questions. Legal compulsion is admittedly a lawful excuse, whatever it may be from the point of view of medical ethics. But when we come to the performance of a moral or social duty, we are faced with serious problems. Let us take some hypothetical cases:—

(*a*) A family doctor is consulted by a husband or wife suffering from syphilis. Is the doctor justified in warning the other spouse to refrain from marital intercourse?

(*b*) A patient who is suffering from lunacy, venereal disease, or tuberculosis in a severe form, tells his doctor that he is engaged to be married, and although the doctor warns him not to do so, insists on proceeding with the ceremony. Is the doctor justified in warning the other party and his or her parents?

(*c*) The family doctor is consulted by an unmarried daughter of the house who proves to be pregnant. Is the doctor entitled to tell her mother?

(*d*) A doctor is consulted by a wife who has procured an abortion and who is seriously ill. Is the doctor entitled to inform the husband?

(*e*) A doctor is called to attend a domestic servant, perhaps a cook or a nurse, and finds she is pregnant or suffering from some contagious skin disease. Is he entitled to tell the mistress?

(*f*) A doctor is consulted by an engine-driver who thinks he is suffering from nervous exhaustion. The doctor diagnoses G.P.I. and tells the patient he is not fit to drive. The patient disagrees. Is the doctor justified in reporting the matter to the railway company?

(*g*) A patient shows signs of incipient insanity and talks dimly of suicide. Is the doctor entitled to warn his relatives and friends?

(h) A doctor is consulted by a hairdresser suffering from barber's itch. He warns him not to pursue his calling until cured. The next day he sees him at work. Is the doctor entitled to warn the man's master?

(i) The doctor at a V.D. clinic is consulted by a shop-girl suffering from a most contagious form of gonorrhœa. The patient lives in a hostel belonging to the store where she works. The doctor tells her she should leave the hostel as she may infect her companions. She refuses. Is the doctor entitled to warn her employers?

What is the doctor's position in such cases? Has he a moral or social duty justifying and perhaps necessitating disclosure? If he has, would it be a defence in the Law Courts?

What would be the position of a solicitor faced with similar problems? It is easier to put these questions than to answer them. In this country there is no direct decision on the subject, but an interesting Austrian case was reported in THE LANCET, April 16th, 1921. A V.D. specialist who was sitting in a public bath pool saw a young man whom he had recently treated for a syphilitic sore about to enter it. The physician objected, and as the young man persisted, he reported him to the attendant, who refused to allow him to bathe. Thereupon he brought an action against the doctor for breach of professional confidence. The court dismissed the case on the ground that the doctor had acted in the interests of the community. This admirable decision, which, of course, has no validity in this country, corresponds with views expressed by English judges in relation to the professional privilege of a solicitor. In the Queen *v.* Cox and Railton (1884) 14. Q.B.D 153, the question was whether communications by a client to his solicitor regarding a contemplated fraud could be given in evidence by the solicitor without the client's consent. The Court held that the evidence was admissible, and quoted with approval a passage taken from the report of an earlier case, "no private obligations can dispense with the universal one which lies on every member of society to discover every design which may be formed contrary to the laws of society to destroy the public welfare." The courts are, however, vigilant in enforcing professional secrecy. In Weld-Blundell *v.* Stephens (1920) A.C. 956, the Law Lords and the judges in the Court of Appeal all agreed that there is no reason founded on public policy or any other ground why an agent, in that case an accountant, should be at liberty to disclose a private wrong committed by his principal. This rule had already been laid down in 1836 in Taylor *v.* Blacklow, already quoted. In Taylor's case a solicitor, acting for both parties in a mortgage transaction, was held liable for disclosing to the proposed mortgagee a defect in the mortgagor's title. In the Weld-Blundell case a distinction was, however, drawn by the judges in the Court of Appeal between communications regarding a wrong about to be committed and one committed already. Lord Justice Bankes put two instances. (1) A person tells his doctor that he intends to commit suicide; (2) a person charged with attempting suicide confesses to his solicitor that he did make the attempt. To protect the patient the doctor would be entitled to disclose the confidence; the solicitor would not be justified in revealing the confession. In both the Weld-Blundell and Tournier cases the judges agreed that disclosure of a confidence would be justified when there is a duty to the public to disclose. The point was elaborated by Lord Justice Bankes, who said: "A contract to keep secret communications as to the proposed commission of a crime or as to the proposed commission of a civil wrong upon an individual may well be considered as an illegal contract, and the duty to the public to disclose the criminal or illegal intention may properly be held to override the private duty to respect and protect the client's confidence."

It is obvious that when called upon to deal with cases similar to those suggested the doctor is required to navigate an uncharted sea. Happily they are rarely presented in the crude form indicated in my hypothetical instances. The patient is usually prepared to coöperate with his medical adviser. But for present purposes we must face the issue. Before doing so I must point out (1) that when a doctor is employed by "A" to examine and treat "B"; for instance, when a medical man is called in and paid by a mistress to examine and treat a domestic servant—the doctor is apparently entitled to make a report to the person employing him. Weldon *v.* Winslow, the *Times*, March 14th to 19th, 1884. An action for libel: A husband asked a medical man to see his wife and report on her mental condition. He reported that she was insane. Held a privileged communication. Presumably it could not have been privileged if a breach of professional confidence. (2) That the position of a family doctor may differ from that of one consulted *ad hoc*. The confidential relationship of the family doctor may justify disclosures that would otherwise be improper. The law of libel and slander recognises that a family solicitor has special duties and privileges regarding the communication of information to his client (Davis *v.* Reeves, Ir. C.L.R. 79). Therefore, by what may be called a double analogy, the special position of the family doctor may well be a factor to be considered. (3) That a doctor attending an infant may be entitled to communicate with his parent or guardian. (4) That the position of a hospital patient differs from that of a private one, inasmuch as there is no contract between the doctor and the patient. Such a patient's rights to secrecy are not well defined, but it is conceived that the medical staff are under obligation to the patient not to disclose matters of delicacy, at any rate outside the institution.

In the French code the director of a hospital is specially prohibited from disclosing professional secrets relative to the safety of patients or family honour.

I now come to the general question of what should the doctor do when he perceives that grievous injury may result to a third party or parties if he refrains from making a communication that may involve the disclosure or partial disclosure of a professional confidence. A distinguished legal friend of mine has suggested that in certain cases disclosures may be justified on the ground that the object is to prevent the patient from doing a wrongful act. There is much to be said for this argument. The spread of infectious disease, for example, may give rise to criminal and/or civil liability. R. *v.* Vantandillo (1815) 4 M. and S. 73. Boardman *v.* Boardman (1866) 1 P. and M. 233. R. *v.* Clarence (1889) Q.B.D. 22. Clerk and Lindsell on Torts 7th edition 495. Stephen's Digest of Criminal Law, 6th edition, 147. Lord Stowell described the communication of venereal disease as "an injury of a most malignant kind." Mr. Justice Hawkins described it as "an abominable outrage" and "an atrocious barbarity." The doctor may therefore claim that in certain cases he is entitled to take reasonable steps to protect the patient against himself. He may also claim, relying on the dicta in Cox *v.* Railton, Weld-Blundell and Tournier, that it is a public duty to prevent wrongful acts and that there are occasions when the duty imposed by a professional relationship should be subordinated to the higher duties of common humanity. The terrible consequences to innocent persons of secrecy in the hypothetical cases of the syphilitic husband or wife, the diseased fiancé, the syphilitic cook or nurse, the hairdresser with barber's itch, the shopgirl suffering from gonorrhœa, or the lunatic engine-driver are matters deeply concerning the public welfare. Disclosure to avoid such consequences is justifiable and perhaps obligatory on both legal and ethical grounds. But admitting this, the practical question still remains to be answered: What should the doctor do? If he gives the warning he may get no thanks; he is certain to incur the serious displeasure of his patient, and he may find himself faced with legal proceedings. On the other hand, his conscience may worry him if he stands by and allows an innocent person or persons to run a serious risk which might be prevented by a word of warning. Moreover, in some cases if he remains silent he may run the risk of incurring public or private odium and censure. No practical rule can be laid

down. It all depends on the individual and the particular case.

THIRD PROPOSITION.

"There is no legal privilege for medical confidences. If called as a witness a doctor must answer such questions as may be put to him by the Court."

This has been decided in many cases. The Duchess of Kingston's case (1776) 20 How. St. Tr. 572 et seq. R. *v.* Gibbons (1823) 1 C. and P. 97. Wheeler *v.* Le Marchant (1881) 17 Ch. D. 681. The subject is highly controversial. Strong objection has been raised by doctors to answering in the witness-box questions involving a disclosure of professional confidences. The claim is that such confidences are or should be privileged in the same fashion as communications between solicitor and client. This view has been held not only by medical men, but by distinguished lawyers. For instance, the learned author of "Best on Evidence," describes the rule as "harsh in itself, of questionable policy, and at variance with the Code Pénal in France and the Statute Law in some of the United States of America." (See p. 560, 11th edition.) It is claimed by some medical men who object to the rule that communications made to spiritual advisers are protected from disclosure in courts of justice. This is inaccurate. (See cases quoted in Best, p. 561.) It may also be pointed out that the claim to spiritual privilege is based on legal grounds which have no application to the medical profession. It is argued that communications made to priests and other ecclesiastics were entitled to privilege under the Canon Law and that, although repealed, these particular canons are still part and parcel of the existing Common Law.

There also seems to be some misapprehension in medical circles as to the privilege accorded to communications between solicitor and client. The privilege is that of the client and not of the solicitor, who himself has no privilege (Taylor on Evidence, 16th edition, Section 911, and cases there quoted). Except as mentioned later, the solicitor must not disclose professional communications in the witness-box unless with the consent of his client, but they must be revealed if the client so desires. Those who claim privilege for medical communications also labour under the misapprehension that privilege attaches to communications made by a client for a fraudulent or criminal purpose, as, for instance, if a solicitor were questioned as to the most skilful mode of effecting a fraud.

The case for medical privilege is put thus. Medical confidences are sacred. Therefore they should be treated as such in all circumstances. Medical efficiency is a public necessity. To secure it patient and doctor must be assured that their communications will not be disclosed. Truth in litigation may cost too dear. In the interests of the community at large it is more important to maintain the sacred character of confidential relationships than to secure accuracy in a few law cases. On the other side it is claimed that it is undesirable to increase the limitations on evidence, that the existing system has caused no injustice or inconvenience, that there has been no public protest against it, that there is no evidence that fear of disclosure deters patients from confiding in their medical advisers, that the confidences of criminals could not properly be subject of privilege and that, eliminating such confidences, there are but few occasions on which disclosures detrimental to the patient are required. A typical case will display the respective points of view. A woman whose husband has been abroad 12 months consults a doctor as to her pregnancy. She has a spontaneous miscarriage. Her husband returns and lives with his wife. Some months later he hears that she had been unfaithful. He takes proceedings in which the doctor is subpœnaed as a witness. The doctor is asked what he treated the wife for. According to medical critics of the existing law it is improper that the question should be answered. The woman was compelled by her condition to consult a doctor. Is it fair and right that by so doing she should involuntarily provide evidence of adultery? Had she gone to a solicitor for advice as to the legal position arising from her indiscretion her communications with him would have been protected. It is an *a fortiori* case that communications with her doctor should receive similar protection. According to their opponents it would be an injustice if the husband were debarred from proving his case. Any change in the law would require to be made by Statute and there is little chance that Parliament would alter the existing rule. Any such alteration would almost certainly be vigorously opposed by the Law Lords and judges. The whole tendency of legislation for many years past has been to simplify the law of evidence and to remove restrictions which prevent the whole story from being disclosed to the court. Consequently it is extremely unlikely that Parliament would be prepared to add to such conventions as still exist. On balance it seems most undesirable that fresh privileges should be created which may have the effect of obscuring the truth. Those who wish to explore this subject further should read Lord Birkenhead's brilliant article, "Should a Doctor Tell?" "Points of View, Vol. I."

FOURTH PROPOSITION.

"A doctor shares with other citizens the duty to assist in the detection and arrest of a person who has committed a serious crime."

The law is clear. (See Russell on Crimes, 8th edition, Vol. I., p. 130.) A person who, knowing a felony to have been committed by another, relieves, comforts, or assists the felon, is an accessory after the fact. I suppose that binding up a murderer's wounds and sending him on his way rejoicing might suffice. Hale, however, expresses the view that a surgeon can safely attend a felon, but if he fails to report the felony to the police he will be guilty of misprision of felony. (I. Hale 332.) Misprision of felony consists in concealing or procuring the concealment of a felony known to have been committed. It is sufficient to neglect to inform the police. The offence, however, seems to be almost obsolete and it may be doubted whether any prosecution is likely to be instituted in practice. It is obvious that it is no part of the duty of a doctor to act as a private detective. It is also plain that when, in the course of his professional duties, he has reason to think that a serious crime has been committed, he is bound to help to bring the offender to justice although this may involve the arrest of his patient. For instance, suppose that during the hue and cry for the trunk murderer a doctor had been consulted by a man suffering from injuries which he admitted were sustained when struggling with a woman who had been killed in the encounter, obviously it would have been the doctor's duty to inform the police. Furthermore, no alleged ethical rule could have justified him in shielding such a criminal from justice. Plain cases of this kind require no further comment. Law and ethics demand prompt and decisive action. Indeed, even in the absence of a confession by the criminal, it would be the duty of the doctor to warn the police if he thought the circumstances suspicious. If the patient were innocent he would not suffer. If he were guilty he would get no more than his deserts.

Mr. Justice Hawkins remarked in the Kitson case (1896): "There might be cases when it is the obvious duty of a medical man to speak out, and it would be a monstrous thing for a medical man to screen a person coming to him with a wound which it might be supposed had been inflicted in the course of a deadly struggle." In the Pritchard poisoning case the doctor stated that when he first saw deceased he was under the impression she was being poisoned. Commenting on this the judge said that it was inconsistent with the doctor's duty as a medical man and a citizen to keep this information to himself. He added: "I care not for professional etiquette or rule; there is a rule of life and a consideration far higher than these, and that is the duty of every citizen and of every right-minded man to his neighbour, to prevent the destruc-

tion of human life and in that duty I cannot but say that the doctor failed." Difficult questions, however, arise as to crimes of certain classes such as abortion. If a woman admits to an abortion is the doctor bound to go to the police, and if not is he justified in doing so? In the Kitson case Mr. Justice Hawkins doubted whether a medical man would be justified, "for such a thing would be monstrous cruelty." Too much attention must not be paid to this dictum as the point did not arise for decision. More reliance may be placed upon Mr. Justice Avory's charge to the grand jury at Birmingham in December, 1914 (49 L.J. 713). A woman had died as the result of an illegal operation. Three medical men in succession attended her, and to one at least she confided the name of the abortionist. No information was given to the police so that the woman died without making a statement that could be given in evidence. The judge said that under such circumstances he had no doubt it was the duty of the medical man to communicate with the police so that steps might be taken to assist in the administration of justice. There were cases when the desire to preserve professional confidence must be subordinated to the duty of every good citizen to assist in the investigation of serious crime. It might be the moral duty of the medical man, even in cases where the patient is not dying or not unlikely to recover to communicate with the authorities when he sees good reason to believe that a criminal offence has been committed. This pronouncement led the Royal College of Physicians, London, in January, 1916, to pass a series of resolutions concerning cases of criminal abortion. In these they expressed the opinion that a moral obligation rests upon every medical practitioner to respect the confidence of his patient, and that without her consent he is not justified in disclosing information obtained in the course of his professional attendance on her. Also that every medical practitioner who is convinced that a criminal abortion has been practised on his patient should urge her, especially if she is likely to die, to make a statement which can be taken as evidence against the person who has performed the operation, provided her chances of recovery are not thereby prejudiced. If she refuses he is under no legal obligation (so the College was advised) to take further action. Before taking any steps which may lead to legal proceedings a medical practitioner will be wise to obtain the best medical and legal advice obtainable, "since in the present state of the law there is no certainty that he will be protected against subsequent litigation."

Before issuing this memorandum the British Medical Association had an interview with the Lord Chief Justice, the Attorney-General, and the Public Prosecutor, when the Public Prosecutor explained that the authorities desired that medical men should report abortions attempted or procured by third parties when the doctor was of opinion that the patient was likely to die. As appears from the resolutions, the College advised their members not to give effect to these wishes. The British Medical Association adopted the same attitude. This view, however, does not meet with universal medical approval. Dr. Sidney Smith says, in his work on Forensic Medicine, 1925: "It is no part of a doctor's duty to act as a detective, but it is equally certain that it is no part of his duty to act as a screen for the professional abortionist." Similar views are expressed in Dr. Robertson's "Medical Conduct and Practice" (1921). Since 1916, when the College of Physicians passed their resolutions, the practice of abortion has greatly increased. For instance, last week I noticed no fewer than five reported cases, in all of which I think the women had died. The question is whether, apart from legal obligation, the medical profession are justified in helping to conceal acts of this character. Of course a good deal depends upon the facts of the particular case. If the patient is not seriously ill, it would seem that the doctor is not justified in making a disclosure unless there are special circumstances. For instance, if the case is one of a series in which operations have been performed by the same abortionist. An East-end doctor, tried for murder, had kept records showing that he had performed no fewer than 400 abortions. Considering the prevalence of abortion the leaders of the profession are undertaking a serious responsibility in advising practitioners in such emphatic terms to disregard illegal acts of a most pernicious character.

To sum up, everyone recognises the necessity and importance of medical confidences. Everyone recognises that they are sacred and precious. But we must recognise also that the rules regarding them exist for the welfare of the community and not for the aggrandisement or convenience of a particular class. We must recognise, also, that they must be modified to meet the inevitable changes that occur in the necessities of various generations. As Cicero says: "*Salus populi suprema lex esto*," or in English, "Let the good of the people be the paramount law."

COLOUR TESTS FOR VITAMIN A.

THEIR APPLICATION TO NATURALLY OCCURRING PRODUCTS.

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Rosenheim and Webster [1] have recently published in this journal a study of some of the colour tests suggested for vitamin A. This work, which was confined to oils derived from the animal kingdom, showed that there is an apparent relationship between the results of feeding experiments and the intensities of colour obtained with arsenic trichloride (Kahlenberg's reagent),[2] which has been chiefly used by Rosenheim and his co-workers. A number of other reagents, however, have been suggested for vitamin A by different investigators, including concentrated sulphuric acid (Drummond and Watson),[3] powdered phosphorus pentoxide (Fearon),[4] trichloracetic acid alone (Rosenheim and Drummond),[5] or with pyrogallol or other polyphenols (Fearon),[4] and antimony trichloride (Carr and Price).[6] Of these, it has recently been demonstrated simultaneously by Rosenheim and Webster, [7 8 1] and by Willimott, Moore, and Wokes,[9 10] that Fearon's trichloracetic and pyrogallol reagent is not specific to vitamin A. So far as the remaining colour tests are concerned, their specificity is not yet clearly established, and it is obvious that many further data will be required, especially on foodstuffs of vegetable origin which have been shown by feeding experiments to contain vitamin A.

Relative Sensitiveness of Colour Tests.

At the outset* of our investigation of this problem it seemed advisable to ascertain the relative sensitiveness of the four colour tests under parallel conditions. For this purpose we employed a number of cod-liver oils, whose potency in vitamin A was known from feeding experiments, and for which the analytical constants had been obtained. A method was then required for the controlled quantitative destruction of the vitamin in a concentrated source, such as cod-liver oil. It was shown by Zilva,[11] in 1919, that exposure to ultra-violet rays destroys the vitamin A in butter. More recently Peacock [12] observed the same effect in cod-liver oil, using both sunlight and various other sources of the actinic rays, but in his paper in this journal no details were given of the period of exposure or of the distance from the mercury-vapour lamp. Holmes and Pigott [13] independently confirmed Peacock's conclusions in regard to the destructive action of the actinic rays in sunlight. Working in Prof. E. C. C.

* In this portion of the work a grant towards the expenses was received from the Pharmaceutical Society of Great Britain.

Baly's laboratory with a Hewittic quartz mercury-vapour lamp at a distance of 3 inches, we have been able to show that complete destruction of vitamin A in a potent oil occurred within two hours. The four colour tests were applied to samples withdrawn at frequent intervals during the course of the destruction, and it was found that concentrated sulphuric acid and phosphorus pentoxide became negative after an hour's exposure, and would therefore seem to be only about half as sensitive as the arsenic trichloride and antimony trichloride tests. Fearon's trichloracetic and pyrogallol test, on the other hand, persisted with undiminished intensity throughout five and a half hours' exposure, and was still quite definitely positive when the experiment was discontinued, thus confirming its non-specificity.

Disturbing Factors in the Application of Colour Tests.

Employing a Lovibond tintometer, as described by Carr and Price,[8] we succeeded in obtaining on these samples of oil withdrawn at five-minute intervals quantitative readings of the blue colour given by arsenic trichloride and by antimony trichloride. Since it has been suggested by Rosenheim and Drummond,[5] and by Takahashi and others,[14] that the blue colour is indicative of vitamin content, we used these readings to measure the amount of vitamin destroyed by the ultra-violet rays. Similar results were obtained with the two reagents, but antimony trichloride was found rather more sensitive, the blue colour persisting longer, and enabling us to take readings down to about 70 per cent. destruction, using the 30-second limit we have suggested.[10] A somewhat extended study of Carr and Price's method, to be published elsewhere,[23] has led us to the conclusion that it is necessary to pay attention to a number of factors, including temperature, time at which reading is taken, concentration of reagent, and of vitamin, if reliable results are to be obtained.

In the course of this work on irradiation of cod-liver oils an important observation was made that destruction of the vitamin continued after the oil had been removed from the action of the rays, even though it was protected from the action of daylight and tightly stoppered. Thus the actinic rays would seem to set in train destructive processes which apparently continue, month after month, until the whole of the vitamin is rendered inactive. An oil, for instance, in which only 3 per cent. of the vitamin A was destroyed at the time of irradiation, was found three months later to have lost 25 per cent.[16] Strong emphasis is therefore laid upon the necessity of protecting all cod-liver oil, and also other sources of vitamin A, such as milk and butter, from even a few minutes' exposure to the actinic rays. Otherwise, an oil whose original potency had been ascertained by laborious and costly animal experiments (cf. Willimott and Wokes, 1925)[10] might have lost subsequently a serious amount of its vitamin before being used clinically.

TABLE I.—*Pigments Involved in Photosynthesis.*

—	Suggested formula.	Colour by transmitted light.	M.P.C.
Chlorophyll A	$C_{55}H_{72}O_5N_4Mg$.	Bluish-green	Becomes viscous at 117–121°.
„ B	$C_{55}H_{70}O_6N_4Mg$.	Green	Becomes viscous at 120–130°.
Carotin ..	$C_{40}H_{56}$	Red	167·5–168°.
Xanthophyll	$C_{40}H_{56}O_2$	Yellow to orange	173–174° (Schertz).[19]

Another disturbing factor in the application of colour tests, especially to foodstuffs of vegetable origin, is the occurrence of various pigments. Even in cod-liver oil, Drummond and his co-workers,[17] in their recent comprehensive attempt to isolate vitamin A, found a close association between the vitamin and the lipochrome pigments of the oil. Takahashi and his colleagues [14] obtained a similar coloured concentrate, which they called "biosterin." These facts led Drummond to reconsider the theory originally put forward by Steenbock,[18] in 1919, of the possible identity of vitamin A with one of the lipochrome pigments. Of the many types of pigment found in plants, those most closely concerned with vitamin A are undoubtedly the group of four pigments involved in photosynthesis, the more important properties of which are summarised in Table I. from results published by Willstätter.

Relation of Vitamin A to Photosynthetic Pigments.

In some unpublished experiments, Willimott and Moore attempted to ascertain whether chlorophyll A or B could function as possible precursors of vitamin A. Our experience was that chlorophyll extracted from nettle leaves and other sources induced growth in rats on a vitamin A-free diet. Whether this was due to the chlorophyll itself or to the presence of traces of vitamin adsorbed upon it remains an open question, the latter explanation being the more feasible. A commercial sample of flake chlorophyll, supplied by a leading maker as supposedly pure, when fed to rats gave a definite negative result, but, unfortunately, was found to be contaminated with copper. It is noteworthy that phytol, a product of the hydrolysis of chlorophyll, was tested independently by Javillier [20] and his co-workers, and by Drummond,[17] in 1925, with negative results in both cases.

It is somewhat surprising that of the other two photosynthetic pigments carotin has received by far the most attention, although it occurs in the green leaf in smaller amount than does xanthophyll. Perhaps this is explained by the fact that vitamin A accompanies carotin rather than xanthophyll in the phase test. Carotin was fed by Drummond[21] in 1919, by Miss Stephenson [22] in 1920, and again by Drummond [17] in 1925, in every case with negative results. A most interesting colour reaction of carotin is its behaviour with either arsenic trichloride or antimony trichloride. In each case a deep *permanent* blue is obtained. In the application of colour tests for vitamin A to foodstuffs and pharmaceutical preparations these reactions are of peculiar significance.

In the case of xanthophyll, which also gives a permanent blue with these reagents, Drummond was unable to obtain a specimen sufficiently pure for feeding, while in 1920 Rosenheim and Drummond,[23] who fed an impure preparation of xanthophyll to rats, obtained a growth response, but rightly considered the results inconclusive. In view of this, it was thought worth while to prepare pure crystalline xanthophyll and to feed it to vitamin A-deficient rats. This experiment of Willimott and Moore [24] showed conclusively that xanthophyll is not identical with vitamin A, a result which had been indirectly obtained by Palmer and Kempster,[25] who fed chicks for two generations on a diet devoid of xanthophyll and still obtained normal growth and well-being, although the eggs and tissues were practically free from pigment.

It would thus appear probable that vitamin A is not identical with any of these four photosynthetic pigments. Steenbock's theory has indeed been abandoned by its originator,[26] and by Drummond,[27] and other workers. Nevertheless, these pigments, which are found widely scattered throughout the vegetable kingdom, as well as in certain animal products, cannot be ignored when colour tests are being applied to foodstuffs, because both carotin and xanthophyll give *permanent* blue colours with arsenic trichloride and antimony trichloride and therefore interfere with the *transient* blue colours given by these reagents with vitamin A. The question arises: Is it possible to remove carotin and xanthophyll, and chlorophyll also if present, from foodstuffs and natural products without affecting the content of vitamin A?

The method which appeared to us to offer most promise was adsorption of the pigment by means of a suitable agent. A series of finely powdered charcoals and other adsorbents was obtained and their relative adsorptive capacities determined. The

results obtained, details of which will be published elsewhere, showed that it is possible to remove any of these interfering pigments from foodstuffs, such as butter-fat, egg yolk fat, maize oil, spinach, &c., by several hours shaking of a petroleum ether solution with a good charcoal, using approximately 10 g. to each 100 g. of butter-fat, &c. The vegetable charcoal norit gave the best results. Whether in the removal of the pigment the vitamin A also is affected is a point we have had under consideration. Evidence so far obtained, both by feeding experiments and by colour tests, would seem to indicate that vitamin A is not adsorbed to any very considerable extent by charcoal used to remove carotin and xanthophyll. In the meantime, employing this technique for the removal of interfering pigments, we have applied the above described colour tests to a variety of foodstuffs and natural products whose potency in vitamin A has been ascertained by feeding experiments in most cases. In Table II. are summarised the results obtained with cod-liver oils, their unsaponifiable fractions, and other derivatives.

Colour Tests for Vitamin A in Cod-liver Oils and Derived Products.

The three samples of cod-liver oil obtained from different sources† gave practically identical results with arsenic trichloride and with antimony trichloride; the colour persisted with undiminished intensity when equivalent amounts of the respective unsaponifiable fractions were tested. The Iceland oil, which gave the most intense reactions, has been found to protect completely from vitamin A-deficiency albino rats to which it was given as sole source of this vitamin over a period of several months, in doses of 20 mg. When the vitamin A in these oils is destroyed in various ways, by treatment with concentrated sulphuric acid, or with phosphorus pentoxide, by irradiation, or by aeration at different temperatures, we have always found all the tests agree in becoming negative. The results we obtained by aeration, which are given in detail elsewhere,[28] show close agreement with those obtained in 1925 by Rosenheim and Drummond,[5] who found that the arsenic trichloride test became negative after 1 hour's aeration at 100° C.

Since cod-liver oil is known to contain two of the three different fat-soluble vitamins, it seemed desirable to ascertain whether the presence of vitamin D in any way interfered with the colour tests for vitamin A. For this purpose the Glaxo Research Laboratories kindly supplied us with a sample of cod-liver oil from which vitamin D had been completely removed by the Zucker[29] process. Feeding experiments had shown this to be a D-free source of vitamin A, and on applying the colour tests strong positive reactions were obtained in each case. On the other hand, a concentrate of vitamin D (ostelin) obtained from the same laboratory gave negative results. These findings indicate that the colour tests for vitamin A are not qualitatively interfered with by the presence of vitamin D, an observation of interest in view of the fact that the actinic rays necessary for the production of vitamin D are now known to have a destructive action on vitamin A.

Olive oil and oleic acid appear to exert some inhibitory effect upon the application of the colour tests. Pure olive oil and oleic acid of themselves give negative results, and would thus appear to be possible diluents for cod-liver oil. Olive oil has in fact been frequently used in this capacity, but its unsatisfactoriness is obvious, because of the possible presence of organic peroxides, which gradually destroy the vitamin A. Another disadvantage where feeding tests are being made in parallel with colour tests is the fact that low concentrations of cod-liver oil (5 per cent.) in olive oil may not be detectable by the colour tests, even when freshly prepared solutions are examined.

† We are indebted to Messrs. Allen and Hanburys, Parke, Davis and Co., Southall Bros. and Barclay, and Evans, Sons, Lescher and Webb for supplying samples of cod-liver oil of definite origin, also much information in regard to the various processes adopted in their preparation.

In the case of cod-liver oil, we have not been able to remove the natural pigments by adsorption on to charcoal, but the amount present in the pale refined oils usually supplied for medicinal purposes is not sufficient to cause appreciable interference with the colour tests. It is significant that carotin or xanthophyll‡ (1 in 2000) added to a cod-liver oil, whose vitamin A has been completely destroyed by irradiation, causes positive results to be given by arsenic trichloride or antimony trichloride. Fortunately, it is possible to remove these pigments by shaking with a suitable charcoal; also other experiments show that this procedure does not appear to remove any vitamin present.

Colour Tests for Vitamin A in Foodstuffs and Natural Products.

On turning to foodstuffs and natural products (Table III.) containing vitamin A, it is impossible to obtain satisfactory results until the interfering pigments have been removed by adsorption. Butter-fat, after complete decolorisation, still gave definitely positive tests. An interesting discovery was that annatto, which is commonly used to colour butter, butter substitutes, and cheese, gives a transient blue colour with the vitamin reagents, due probably to the constituent bixin. Fortunately, this also could be removed by adsorption. In order to ascertain the possibility of applying the colour tests to infants' foods, samples of dried milk prepared by the roller and by the spray process were also tested. Three samples of lard examined all gave negative results.

The samples of orange and of lemon rind oils had been prepared for us by Mr. C. P. Wilson in the research laboratory of the California Fruit Growers Exchange at San Dimas by cold expression from the peel of fresh ripe fruit. They had been carefully protected from the action of light and air. The orange oil was of deep red-brown colour, and it was impossible to observe the characteristic blue colour until the pigment had been removed. The lemon oil was of a yellow colour, and also required to be decolorised. The results obtained with colour tests on these rind oils, after decolorisation, agreed with the findings of Morgan[30] and ourselves[31] working on the actual rinds, and testing for vitamin A by feeding experiments. Our results go to confirm Morgan's conclusion that fresh orange rind oil is one of the most potent sources of vitamin A in the vegetable kingdom. In the case of the orange juice, which was obtained from fresh ripe Californian navel oranges (Sunkist variety) 125 c.cm. of juice was concentrated in vacuo, the residue taken up in a little water, well extracted with chloroform, decolorised, and evaporated nearly to dryness. The product gave definitely positive reactions with the two colour tests, arsenic trichloride and antimony trichloride, but doubtful results with the other two tests. The same juice tested on albinos for vitamin A had a curative dose of 5 c.cm. per head per day.[34]

Another potent source of vitamin A in the vegetable kingdom is spinach leaves. An acetone-ether extract of early spring spinach was prepared of such potency that 25 mg. was a protective dose for rats on an A-free diet. This extract was taken up in petroleum ether and decolorised with norit, and the colourless filtrate was concentrated in vacuo and tested. Since Chick and Roscoe[32] found fresh spinach leaves to be a source of vitamin A practically free from vitamin D, the procedure has been adopted in many laboratories of using fresh spinach leaves as a source of vitamin A when testing for vitamin D. In view, however, of the large dose of the fresh leaf that may be required (Chick and Roscoe found that over 2 g. may be necessary) and the wide variations which may occur in vitamin content, we[33] suggested some time ago that an acetone-ether extract of carefully dried spinach leaves might prove a much more stable and concentrated source of vitamin A. It is of interest to

‡ Crystalline samples of pure carotin and xanthophyll were kindly supplied by Prof. Heilbron, of Liverpool University, for the purpose of this work.

TABLE II.—*Colour Tests for Vitamin A in Cod-liver Oils and Derived Products.*

Material tested.	Colour tests (*a*).				Vitamin A content by feeding experiment (*b*).
	Conc. H_2SO_4	P_2O_5.	$AsCl_3$.	$SbCl_3$ in $CHCl_3$.	
Norwegian cod-liver oil (Lofoten, 1926)	++	++	+++	+++	+++
After 2 hr. irradiation at 3 in. ..	–	–	–	–	–
After treatment with H_2SO_4 ..	–	–	–	–	–
After treatment with P_2O_5 ..	–	–	–	–	–
Newfoundland cod-liver oil ..	++	++	++++	++++	++++
Aerated ½ hour at 98° C.	±	±	++	++	
Aerated 75 minutes at 98° C. ..	–	–	–	–	–
Iceland oil	+++	+++	+++++	+++++	++++
After 2 hr. shaking with norit ..	+++	+++	+++++	+++++	++++
Irradiated cod-liver oil (2 hr.), plus carotin or xanthophyll, 1 in 2000	? (*c*)	? (*c*)	+ + (*d*)	+ + (*d*)	–
After adsorption of pigment by norit	–	–	–	–	–
10 % cod-liver oil in olive oil (*e*) ..	+	+	+	+	+
50 % cod-liver oil in oleic acid (*e*) ..	? (*c*)	? (*c*)	+	+	
Cod-liver oil freed from vitamin D .	++	++	++++	++++	+++
Ostelin (2 samples) ..	–	–	–	–	–
Olive oil, pure ..	–	–	–	–	–
Squalene (*f*)	–	–	–	–	–

TABLE III.—*Colour Tests for Vitamin A in Foodstuffs and Natural Products.*

Material tested.	Colour tests (*a*).				Vitamin A content by feeding experiment (*b*).
	Conc. H_2SO_4	P_2O_5.	$AsCl_3$.	$SbCl_3$ in $CHCl_3$.	
Dairy butter, Danish (*g*)	?	?	+	+	+
After adsorption of pigment (*g*)	?	?	+	+	+
Vegetable margarine (*h*)	–	–	–	–	–
With annatto (*i*)	+	?	+	+	–
After adsorption of annatto ..	–	–	–	–	–
Egg yolk fat* ..	?	?	+	+	++
Kidney beef suet (*j*)	–	–	+	+	+
Shredded suet ..	–	–	–	–	–
Lard (3 samples)	–	–	–	–	–
Dried milk food roller process (*k*)	?	?	+	+	+
Spray process (*k*)	?	?	±	±	
Orange rind oil* .	?	?	++	++	+++
Lemon rind oil* ..	–	–	–	–	–
Orange juice extract*	?	?	+	+	+
Spinach extract*	?	?	++	++	+++
Carrots extract* .	?	?	+	+	+
Yellow maize extract*	?	?	+	+	+

* Depigmented.

NOTES ON TABLES II. AND III.

(*a*) All these tests were carried out in dry test-tubes, using anhydrous solvents.

(*b*) Blanks in this column signify that data are not available.

(*c*) Doubtful result, probably negative.

(*d*) Colours greenish-blue, and fade rapidly.

(*e*) Dilution refers to volume in volume.

(*f*) Pure specimen kindly supplied by Prof. Heilbron.

(*g*) Petrol ether extract of clarified fat, filtered, shaken with norit, then refiltered, giving water-white solution.

(*h*) A purely vegetable product of firm consistence made from nut oils. Some samples of margarine contain a proportion of butter, in which vitamin A can be detected by colour tests.

(*i*) An aqueous alcoholic extract of the fruit of *Bixa orellana*.

(*j*) Vitamin A content of different samples of beef suet was found to be variable.

(*k*) Unsaponifiable residue from ethereal extract, taken up in petrol ether, depigmented with norit, filtered, and evaporated at 38° to 40° C.

note that we have since found such an extract to be a highly potent source of vitamin A, when measured by either animal experiments or colour tests, and further experiments have also shown that it contains no appreciable amount of vitamin D. Finally, a number of vitamin A-containing foods, such as carrots and yellow maize, were dried at 40° C. and extracted with ether, the ether-soluble matter being then decolorised and examined as above described.

It will thus be seen that the successful application of colour tests for vitamin A to pharmaceutical materials and to foodstuffs demands the careful observation of a number of precautions, some of which are only just beginning to be understood. In view of the laborious and costly nature of feeding experiments, and the wide margin of error in the results, it is obvious that any chemical means which give promise of really estimating the vitamin should be tried on as wide a range of natural products as possible. When the specificity of such tests has been definitely established, and a quantitative technique worked out, the way may be open to a new field of investigation of the first importance in human nutrition and well-being.

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STREPTOCOCCAL SEPTICÆMIA

TWO CASES TREATED WITH CONCENTRATED STREPTOCOCCAL ANTITOXIC SERUM.

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THE gravity of streptococcal septicæmia scarcely needs to be emphasised. In a recent series of 60 cases at the St. Louis Children's Hospital[1] the infection was due in 51 cases to hæmolytic streptococci and in nine to non-hæmolytic streptococci; only one of the hæmolytic cases recovered. The details of Case 1 are published in the hope that the treatment adopted at a time when the patient appeared to be beyond hope of recovery may be found to give equally good results in other cases of streptococcal septicæmia.

CASE 1. *Septicæmia Secondary to Otitis Media in a Child* (by Drs. Sanderson and Capon).—The patient, aged 6¼ years, was an only daughter. She was born in Singapore, but had been in England for about ten months. Her only previous illness was broncho-pneumonia when 1 year of age. On March 14th, 1927, while at school, she came under the care of Dr. R. M. Littler, of Southport, on account of slight pyrexia, followed in three days by left-sided otorrhœa. Careful inquiry elicited that she had been troubled with a slight cough since Christmas, 1926, and that she had seemed lethargic and drowsy for about three weeks before the ear began to discharge. It is noteworthy that there had been no previous aural trouble, and that little pain was present. The throat was normal.

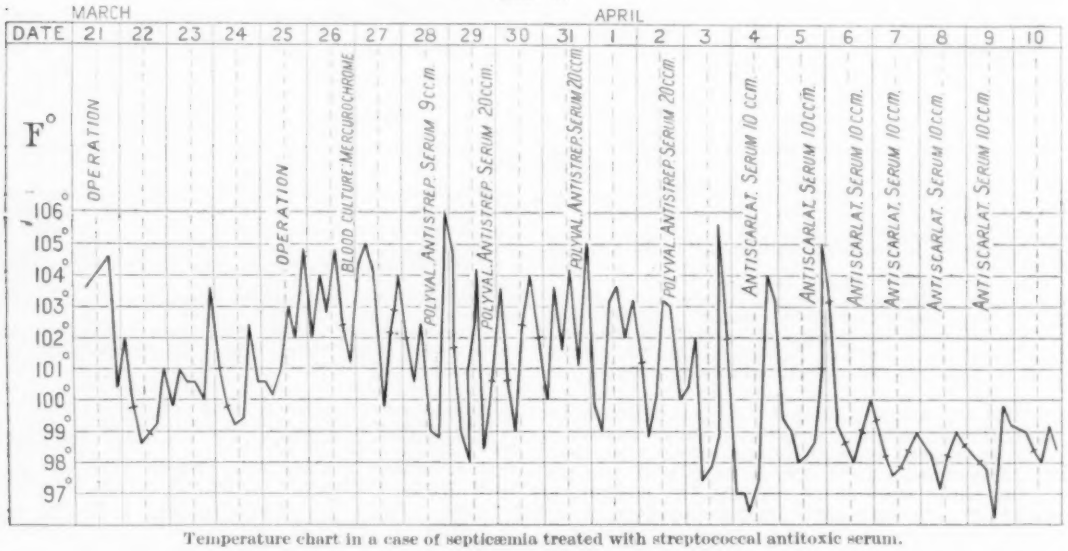
On March 21st she was seen in consultation by one of us (W. S.), who found the left tympanic membrane to be red and bulging, with sagging of the postero-superior wall of the meatus. There was no tenderness behind the ear. The mastoid antrum was opened on the same day and many air cells were found to contain pus. The temperature fell to normal, but began to rise again (see Fig. 1).

On the 25th the temperature was still ascending; the lateral sinus, middle cranial fossa, and cerebellum were exposed and examined; no local cause of pyrexia was found. On March 26th the patient was seen also by N. B. C. She then looked extremely ill. The tongue was coated, the breath foul-smelling, the lips were dry and there was a slight follicular infection of the tonsils. The chest showed no abnormal signs except those of slight bronchitis. The spleen was not palpable. The pulse was rapid (150) and soft. In the heart the only abnormal sign was a soft blowing systolic bruit at the pulmonary area. The eye-grounds were normal. The urine (not a catheter specimen) was slightly turbid and contained a trace of protein, much acetone, and microscopically only a few epithelial cells. No reducing substance was found.

With the evening rise of temperature the patient's condition deteriorated still further and a blood culture was taken at midnight on the 26th. Four broth tubes were inoculated with varying quantities of the patient's blood, and at the same time 3 c.cm. of a 1 per cent. mercurochrome solution were injected intravenously. On cultivation of the blood-broth each of the four tubes was found to contain a pure growth of hæmolytic streptococci. Daily subcutaneous injections of polyvalent antistreptococcal serum were then instituted; the first dose was 9 c.cm. and subsequent doses were 20 c.cm. Two well-known brands of serum were used without any appreciable effect. The patient's general condition became extremely bad; slight rigors developed and the peculiar smell of the moribund septicæmic patient was noted. Granular casts appeared in the urine.

It was then decided to employ concentrated scarlatinal streptococcal antitoxic serum (Burroughs Wellcome and Co.) and the special advice of Dr. G. R. James, who has worked for a considerable time in Prof. J. M. Beattie's laboratory upon streptococci, was invited. He recommended intramuscular administration of the serum in 10 c.cm. doses; the effect will be noted in Fig. 1. The patient's clinical condition improved pari passu with the cessation of pyrexia and the rapid improvement which resulted seems almost certainly to have been due to the antitoxic power of the serum used. The wound has not presented any unusual features and is now healed. The patient has been free from fever since April 9th. She is rapidly losing the anæmia and marasmus which were previously so marked, and her condition may be described as excellent. She is now walking again, and full recovery may be anticipated.

FIG. 1.



Temperature chart in a case of septicæmia treated with streptococcal antitoxic serum.

CASE 2. *Puerperal Septicæmia* (by Dr. MacWilliam).—Mrs. E. E., aged 34, had her seventh confinement on Jan. 12th, 1927. She was attended by a midwife and the child was born without any difficulty. On the third day she had a rigor, and on the 25th she was sent into Walton Infirmary.

On *admission* the temperature was 102·2°, pulse 112. There were no local signs and a blood culture was negative. Collosol iodine, 100 c.cm., was given intravenously, and parathyroid gr. 1/10, and Kalzana (two tablets thrice daily), were ordered. On the 27th temperature was normal and she seemed much better; but on Feb. 2nd a swelling was discovered in the left labium and the temperature began to

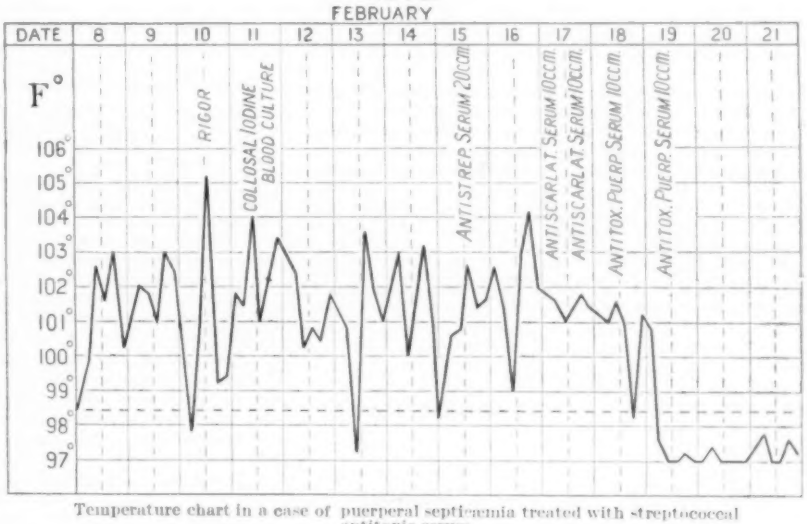
[1] Abt's Pediatrics, 1925, vi., 530.

rise. On the 5th an incision was made in the swelling under nitrous oxide anæsthesia, but the contents proved to be mainly blood-clot. On the 6th the temperature rose to 102·6°. The patient became steadily worse, and on the 10th she had a rigor (see Fig. 2). On the next day she looked very ill; the spleen was palpable and on culture hæmolytic streptococci were found in the blood. Although she was so ill the patient herself said she "felt lovely."

On the 15th I gave 20 c.cm. of ordinary antistreptococcal serum subcutaneously with the intention of giving larger doses intravenously later; but on the evening of the 16th Dr. G. R. James kindly provided me with some concentrated scarlatinal streptococcal antitoxic serum (Burroughs Wellcome and Co.) and soon after midnight on the 17th 10 c.cm. of this serum were given intramuscularly. At midday the patient was considerably better and the dose was repeated. On the 18th and 19th I gave two 10 c.cm. doses of concentrated streptococcal antitoxic serum prepared by the same firm from a puerperal streptococcus. The only reason for using a different type of concentrated streptococcal antitoxic serum was that a further supply of the scarlatinal variety was not immediately available.

On the 20th pulse and temperature were normal, the spleen was only just palpable and the general condition was excellent. There were no further rises of temperature and the patient was discharged cured on March 9th.

FIG. 2.



Temperature chart in a case of puerperal septicæmia treated with streptococcal antitoxic serum.

The prognosis in this case seemed very bad. If recovery was the result of treatment it is remarkable.

Clinical and Laboratory Notes.

INFECTION OF THE NASAL SINUSES IN RELATION TO INSANITY.

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CONSIDERABLE attention has been paid of late to the relation of septic foci to insanity. This attention, however, has been directed to sepsis of teeth and tonsils to the relative exclusion of the nasal sinuses, and for this reason the following two cases are recorded. It has proved possible to find references (given at the end of this article) to 19 cases only of the same kind, in 11 of which the patients were males, and in seven females, the sex of one not being mentioned. The distribution of sepsis in the sinuses may be summarised as follows:—

Maxillary antrum	U.	8 cases	Ethmoids	U.	9 cases
	B.	2 ,,		B.	4 ,,
Frontal sinus	U.	4 ,,	Sphenoidal sinus	U.	3 ,,
	B.	3 ,,		B.	2 ,,

U. = Unilateral. B. = Bilateral.

In many of the cases more than one sinus was involved, and in all recovery is reported as following drainage. The two cases now to be reported are as follows:—

CASE 1.—Mrs. A., aged 59, was married at the age of 31, and had one daughter. She was admitted to Holloway Sanatorium on July 17th, 1924, with two months' history of depression and apathy. She said she had "committed the unpardonable sin of blasphemy," and that she had heard the Devil's voice tempting her to kill herself (she had twice attempted suicide and had asked her nurse to kill her). Twenty-five years previously she had been treated in a nursing home for depression.

On admission she was much depressed, and physically was frail, kyphotic, and pigeon-breasted, with a sallow, dry skin. On treatment with thyroid extract increasing from gr. ¼ to gr. 1 three times a day she improved considerably, and in August, 1924, was allowed home; but in a fortnight she was readmitted with delusions of unworthiness and wrongdoing, threatening to take her life. Thyroid treatment was resumed and in October she had improved on grs. 2 t.d.s. By December, 1924, she was more cheerful, but still thought "that God was punishing her."

I saw her in December, 1924, because of persistent nasal and post-nasal discharge which she had noticed for some years. On examination both nasal fossæ contained pus; the ethmoids were swollen and septic. Transillumination showed both antra and frontal sinuses dark. On puncture of the antra both contained pus; X rays showed all nasal cavities to be involved. Operation was advised and the patient was transferred to a nursing home where, under a general anæsthetic on Jan. 20th, 1925, all the cavities, including both sphenoidal sinuses, were opened by the intranasal route, and all showed gross sepsis, a quantity of necrosed bone being removed from both ethmoidal regions. Subsequent treatment consisted in a daily washing-out of all cavities with 1 drachm of a 10 per cent. solution of protargol in a pint of normal saline.

She returned home on Feb. 11th, physically well, but depressed. By April, 1925, she was much better, took up her household duties, and said that "the mists had cleared away." There was still a considerable nasal discharge, for which a daily lavage was carried out by herself at home. I last saw her on March 23rd, 1927, when the nasal discharge had practically ceased and she was mentally perfectly normal.

CASE 2.—Mrs. B., aged 55, was admitted to the Holloway Sanatorium on Jan. 9th, 1926, with a two months' history of restlessness, depression, and marked insomnia, accompanied at times by confusion. There were no hallucinations, nor definite delusions. The complexion was muddy, and the patient stated that she had for some time noticed an offensive discharge from the left nostril. While under treatment the patient complained daily of headaches and, in March, 1926, tenderness was noticed over the left frontal sinus and the left maxillary antrum.

I saw her in April, 1926, and found pus on the left side of the nose; the left frontal sinus and antrum were quite dark on transillumination, and the left antrum on being punctured was full of pus. X ray showed that the left frontal sinus, left antrum, and left sphenoidal sinus were infected, and I advised operation. She was transferred to a London nursing home, but immediately became restive, agitated, and maniacal; she was given gr. 1/100 of hyoscine hydrobromide hypodermically, and returned to the sanatorium on the same day.

The operation of intranasal drainage of the left frontal, maxillary, and sphenoidal sinuses was ultimately performed at the sanatorium on May 8th, 1926. After the operation the cavities were douched out daily with the protargol solution. By May 25th the colour was much improved and there was no headache, but the patient was still agitated. She was discharged from the sanatorium on June 5th, one month after the operation, much improved, showing more self-control and less agitation. This improvement has been maintained, and when I last saw her, on March 28th, 1927, she was perfectly rational and leading a normal, healthy life.

I have to express my thanks to Miss Mildred Warde, F.R.C.S., who assisted me at both operations, for the help she has given me in looking up records, and to Dr. Elizabeth Casson for notes on the patients' condition while they were at the Holloway Sanatorium.

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A NOTE ON
HYPERTROPHY OF THE PAPILLA FOLIATA IN MAN.

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DURING the last four years my attention has been frequently drawn to a condition of the tongue which receives no mention in any of the text-books of surgery that I have been able to consult. The condition appears to be a mild inflammation and hypertrophy of the rudimentary papilla foliata met with on either side of the tongue in man.

In all, 19 cases have been observed in the last four years, all of them males, with an age variation from 20 to 60 years. The patient states that he is experiencing a pricking sensation in the side of the tongue and is often in dire distress, believing that he is developing cancer. No definite ætiological factor can be traced except the sex incidence. Dental sepsis is not a factor, since it occurs both in clean and dirty mouths; further, the site of the trouble is too far back to be influenced by dental trauma. Occupation, diet, and smoking appear to exert no causative effect, and syphilis has been absent in the majority of the cases. Many of the patients appear to be of rather a sensitive and nervous type.

The condition is probably inflammatory in nature but is not associated with acute or chronic superficial glossitis, the rest of the tongue mucosa appearing quite healthy. It may be unilateral or bilateral, and in varying degree on each side. Examination of a portion of tissue excised from a severe case showed some hypertrophy of the papilla, with a mild degree of chronic inflammatory change. The patient complains of a pricking or burning sensation in the affected area of the tongue which is not increased by irritant foods or drink, but occurs especially at night. Examination shows that the papillæ on one or both sides are raised, reddened, and granular in appearance. There is no ulceration, and the rest of the mucosa of the tongue, including the circumvallate papillæ, is healthy. There is no induration and but little tenderness on pressure, no lymph gland enlargement occurs, and the general health is not affected.

Treatment begins with a complete dental toilet, and in most cases the condition will subside with the use of alkaline mouth washes and the local application of 5 per cent. chromic acid solution. Some cases are very resistant, however, and a variety of local applications may be tried, the most generally useful being salicylic acid. As a last resort destruction of the area with the actual cautery will always result in cure.

Medical Societies.

MEDICO-LEGAL SOCIETY.

A MEETING of this Society was held on June 23rd, Lord Justice ATKIN, the President, being in the chair.

Lord RIDDELL read a paper entitled

THE LAW AND ETHICS OF MODERN CONFIDENCES,

which is published in full on p. 4 of this issue of THE LANCET.

After reading his paper, Lord Riddell said the Editor of THE LANCET in a recent book had a chapter on medical secrecy, the views set forth in which did not altogether accord with those held by himself. In the book the comment made on the obligation of the doctor to answer questions in the witness-box was "if a firm stand were taken by the medical profession in the matter, it is unlikely that any prolonged conflict would be required to establish in the law courts a recognition of the duty of medical secrecy." Lord Riddell said he thought it a most dangerous thing for any class of the community, particularly for an educated, cultured class, to engage in what was termed "direct action." If every class of the community which did not like a law endeavoured to get it altered by breaking it, civilisation was bound to break up. There were proper ways of trying to get laws altered. He admitted that other less lawful means had been adopted, and sometimes successfully, but the whole basis of civilisation consisted of the recognition of certain conventions.

Discussion.

Sir WILLIAM COLLINS reminded members that in his first inaugural address he claimed that this Society would act very usefully in discussing subjects in which the lawyer, the doctor, and the layman were deeply interested, and he did not know one to which that applied more aptly than that now being debated. The speaker agreed that the Hippocratic Oath, which some held to have solved the problem, was useless for the purpose; it meant that those who took it undertook not to divulge what they ought not to divulge. Lord Riddell had propounded nine conundrums, but he did not vouchsafe replies; it was noteworthy that he had taken a different position from that he took when, five years ago, he fell foul of Lord Dawson on the sacredness of medical confidence. Now he was prepared to concede that medical confidences should be sacred, but thought there were exceptions. Sometimes it might be the duty of the medical man not to divulge to the patient what the latter was suffering from; for example, in cancer it might be a detriment to the patient's welfare. But if the disease were syphilis, for instance, it was overwhelmingly the doctor's duty to tell the patient because of his danger to the community and the need of receiving prompt and thorough treatment. Sometimes it was not the doctor's duty to disclose, sometimes it was his duty not to disclose what had been imparted to him in confidential relationship. The difficult problems were those cases of abortion which were not likely to be followed by greater consequences. With regard to information obtained in a venereal clinic, Sir William Collins referred to the case of a Chester practitioner who refused in court to communicate information he had received in the clinic, justifying the refusal by the wording of the statutory regulations promising secrecy to the patient. The speaker considered that the medical man was justified in his attitude, and regretted that he did not go further and run the risk of contempt of court rather than divulge the secret. He imagined that there sometimes arose positions in which the medical man and the priest were placed in an identical position, and in which the secrets imparted would not be revealed, even to a judge in the high court.

Dr. F. J. McCANN said he did not think there was any department of practice in which questions of medical confidence arose more frequently than in that of obstetrics and gynæcology. In venereal disease the difficulties were very great. He gave two examples. The first was that of a young married woman, mother of two children. She had acute syphilis, so acute that her condition had been diagnosed as influenza. He told her the nature of her illness; she confessed to adultery. He told the husband only that she had syphilis, that it would be dangerous to have intercourse with her, and that the children should not kiss her or use the same utensils without cleansing. He felt bound thus to protect each member of the family. In the second example the wife of a friend had a verified gonorrhœal discharge. He did not tell her its nature. She went away and a year later returned and asked what was the nature of the discharge for which she had been treated; asked why she wanted to know, she replied that she intended to divorce her husband. He felt justified in telling her the truth and a divorce followed.

On the subject of abortion, he held that the medical man should be a doctor, not a detective; but in regard to criminal abortion, if that was suspected, his method was to ask the patient if she had had abortion procured, and if so he assured her it would be for her good to tell him the manner in which it was brought about. He had in that way obtained information which was valuable for treatment; if the patient seemed likely to die he felt strongly that the doctor should inform the authorities. With regard to unmarried pregnancies, frequently a mistress called in a doctor to examine her servant and guaranteed his fee; was that acceptance or guarantee a justification to impart the diagnosis to the mistress? In such cases when the girl was pregnant he told her so and asked whether he should tell her mistress. If she objected he did not tell; if she consented he told the mistress. He thought the law might well be amended as regards cases in which the doctor discovers on examination absence of internal genital organs in the female. Having made such a discovery should he disclose it? And if he did so could a nullity suit be brought and a decree of nullity obtained? If a woman had had complete hysterectomy performed and kept that knowledge from the husband, should the doctor tell when he discovered it? And could such husband get relief? Female impotence he considered was far more common than male impotence, and all degrees of malformations were met within those organs.

Dr. GRAHAM GRANT contended that the moment a medical man entered the witness-box and had been sworn he was in the same position as any other witness. If in doubt whether he should or should not answer a particular question, he should seek the judge's ruling; that would transfer the responsibility to the judge.

Mr. ERNEST CLARKE contended that if the sanctity of professional confidence was removed, or whittled down, patients would become anxious and would not impart that information which was necessary to the doctor for adequate treatment. Rather than violate the secrecy of what had been told him, the doctor should be prepared to suffer imprisonment.

Dr. HALLIDAY SUTHERLAND said the doctor had no real privilege in these matters, for in recent cases of the kind, as soon as the judge told the doctor he must speak, he did so. The medical profession was not very well represented in Parliament. Lord Riddell must know that no reform had been carried except by direct action. The theme of the present paper was based on the hard case, and it was a dictum of the legal profession that "the hard case makes bad law." Patients went to the venereal disease clinics only because they had confidence in the promise of secrecy, and if they learned of cases in which this had not been respected they certainly would not continue to go to them. He had once been asked to see a man who was supposed to be dying of consumption, but the speaker formed the conclusion that his journey downhill was being assisted by the administration of arsenic. He therefore saw the wife alone and asked her who cooked her husband's food. She at once changed colour and demanded to know the reason of the question. He retorted that he did not think his food agreed with him. Matters improved, and he believed that he had in this case found a way out of a very difficult situation.

Sir WILLIAM WILLCOX thought that Lord Riddell's paper had set out this difficult subject very fairly; he had taken the stand that professional confidence should, wherever possible, be respected. But there were cases in regard to which the following of this strict line would be harmful to the community—i.e., where crime was being continued and was being concealed. In such instances it was the duty of the doctor to take action. At a certain hospital in London a number of cases of obvious instrumental abortion were admitted, and it was known that a particular abortionist was concerned in them. Several deaths resulted in the series. Ought the doctor to hold his tongue in such a case, when patients in that condition were steadily arriving? It was not the doctor's duty to act as detective, nor in cases of abortion due to natural causes was it his function to try to ferret out, by questioning, the possibility that it was a case of criminal abortion. But when there was clear evidence, without asking questions, that crime had been committed, the doctor took upon himself a serious responsibility if he held his peace. He agreed with Dr. McCann that every inducement should be used to get the patient herself to make a clean breast of the matter. If that was not acquiesced in, then, in certain cases, it was the duty of the doctor to inform the authorities, though he would be wise if, before doing so, he took the best available legal advice. Where a medical witness demurred to answering a question and the judge ordered him to answer, Sir William Willcox agreed that he should obey, but under protest. With regard to cases of suspected poisoning, the safe course was to have the excretions examined for poison. If poison was found, of course the authorities should be informed. Dr. Sutherland's wise action protected his patient and also stopped the nefarious practice.

Dr. MORGAN FINUCANE did not think that Lord Riddell had succeeded in showing that the law had much bearing on ethics and medical confidence. No doctor was justified in constituting himself a martyr by refusing to give evidence in court when ordered to do so. Venereal diseases would probably be notifiable before long, and then where would medical confidence stand? The medical profession must endeavour to march with the times and realise the trend of modern legislation.

Summing Up.

The PRESIDENT summed up the discussion. Lord Riddell had presented the subject in a clear and elaborate paper, for which the Society was greatly indebted. When, five years ago, Lord Dawson had introduced a similar subject, the President had stated his views, and he had seen no reason since to alter them. The position seemed to him to be as follows: One question was, What may a doctor tell, in law? That turned upon the question whether or not he was under a legal obligation not to disclose the information he obtained from the patient. He had no doubt that, subject to certain qualifications, it was an implied term of the contract of employment as a medical man that that medical man would not disclose, to the disadvantage of the patient, the information he obtained. The further question arose as to what were the limits of that obligation at law—i.e., not to disclose the information obtained? First, the doctor was not under an obligation to withhold information given to him which would enable a crime to be committed, and the speaker thought he was under no obligation to withhold information obtained from the patient that a crime was about to be committed. The President was not now dealing with the doctor's duty to volunteer that

information, but only with the point as to whether it was a breach of the contract if he did disclose it. It was plain that, in law, he was obliged to disclose the information he obtained from the patient if he was called upon as a witness in a court. There might be two opinions as to whether that ought to be the law, but there could not be two opinions as to whether that was the law at present. There might be involved large questions of social duty, as Lord Riddell had pointed out, all of them admittedly difficult questions; and circumstances might arise in which either the contract did not extend to withholding information in such circumstances because the contractual duty would conflict with the urgent and strong social duty; or that, though the doctor might be under a contract to his patient, yet it might be his duty, as a citizen and a man of honour, to break his contract, for there might be occasions on which a breach of contract was, ethically, justifiable. While a doctor might expose himself, technically, to an action for breach of contract, yet a court, in dealing with the matter, would always have to deal with the question of damages, and in such a case as he was predicating it was difficult to conceive that any jury or any judge would be likely to impose the burden of substantial damages upon him. But other difficult matters, apart from the contractual aspect, might arise. As a rule, the contract was made with the person who employed the doctor, and the person from whom the doctor received his remuneration was not in all cases the patient, such as where the doctor was asked by an employer to examine and treat his servant. And a very obvious case would be that in which a doctor was employed by an insurance company to report on the condition of a proposed assuree. It was plain that in such a case the doctor's contract was with the insurance company, and he could disclose to the latter the information he derived from the examination. He imagined that most doctors would consider themselves under a professional obligation not to disclose unnecessarily the information obtained from the examinee, who, however, was not a contracting party. That obligation it was very important to maintain. Whether the obligation rested upon contract, or upon something short of a legal obligation, an honourable professional understanding, the President held that there was immense importance in the point of view put forward by Mr. Clarke; it was of public importance that persons should be able to have recourse to doctors in full confidence so that they might fully disclose to them their disease and their history, without any anxiety that such would be made public. In regard to no class of case was it of more importance than concerning venereal disease. He could not understand how it would ever be possible to ensure satisfactory treatment of venereal disease, and to ensure that people so suffering would come for treatment in its early stages, or as soon as they could, unless there could be an absolute guarantee against publicity. It was of extreme moment that this confidence should be maintained. When dealing with the legal obligation to tell, he felt there were a great many cases in which the judge should exercise discretion—and it was often so exercised—as to whether he would enforce disclosure or not. There were instances in which the judge could tactfully say he did not think it would be to the public disadvantage if the information were not disclosed.

Then there arose the question as to when a doctor should tell. The cases put by Dr. McCann in illustration of the difficulties met with were distinguishable from each other. The first case raised the question as to disclosure to a third person of a confidence reposed by the patient—i.e., where a wife was suffering from syphilis—and the question for decision was whether the information should be imparted to the husband. He could hardly imagine a doctor in such circumstances as were related failing to take steps in some way to protect the young innocent husband and children. No doubt the obvious course was to insist on getting the permission of the patient to inform the husband, as Dr. McCann did. But each doctor must be the arbiter as to his own honour in particular circumstances. The other question Dr. McCann raised seemed to be a simpler one—namely, that in which the patient was suffering from a venereal disease—and the question was whether she herself should be told the nature of the disease. That did not involve a breach of professional confidence, and the President saw no difficulty in dealing with the position. He had often wondered why a doctor should so often feel it was within his discretion to refuse to tell a patient what he was suffering from. His own feeling was that if he asked a medical man what he was suffering from he was entitled to know, and if the doctor refused to give the information, he was taking upon himself a serious responsibility, even though it might be argued that the refusal was in the patient's interests. Dr. Sutherland had asked what the doctor should do when he found or suspected that a patient was being poisoned; the President did not think that this touched the matter under discussion. In those circumstances the duty of the doctor was to his patient. If he had information that the patient was being poisoned, why should he have qualms as to what information he should publish? What objection could there be to his protecting his own patient? It was not likely that the patient who was being poisoned would object to steps being taken in communicating the facts to the proper quarter. As to the kind of case spoken of by Dr. McCann where the doctor found the genital organs of a wife to be absent, that was a case for the doctor's discretion; the judge was not so well qualified to form an opinion as to what course to take as was the doctor himself. It did not seem to be the kind of case which involved the social duty to the husband. The doctor could use his discretion as to whether he would induce the wife to impart the information to her husband. He, the speaker, agreed that in such case marital relations were seriously affected, but there were cases in which, apparently, happy marital conditions continued between the parties, even where one or other party was unable to perform the ordinary marital duties, and there would be a difficulty, in such a case, in supporting such disclosure without the consent of either husband or wife. It differed from the case in which to continue marital relations involved the infliction of cruelty—namely, in imposing on the innocent party the risk of venereal disease.

The question of abortion was of immense medico-legal interest. This practice was very prevalent, and, apart from the actual danger to life, there was the intense agony to which the victims were frequently subjected. It involved two persons; the ordinary case was that in which the doctor was called in to examine the woman who was suffering from the effects of abortion. Everybody must sympathise with the view of that great judge, Justice Hawkins—who had a kind heart—when he said that for the doctor to feel himself under an obligation to give up his patient as having herself committed a criminal offence when she was, perhaps, suffering from peritonitis, would be a monstrous thing. With that the President agreed. If a woman who had been suffering from the effects of abortion could not consult a doctor without being exposed to the risk of being sent to penal servitude, it would mean that more women would die from this cause than at present, and that women suffering in this way would be deprived of humane treatment. But the question arose as to who was the abortionist; the person who carried out the abortion was the one to get at. Though it might be difficult for the doctor to disclose the name of his patient, it might very well happen that he could procure from her the name of the abortionist, and he might be able to give to the police a hint that in a particular—unnamed—case there were grave reasons for suspecting that such a person was carrying on business as a professional abortionist. But it would be a different matter when death was impending.

Lord RIDDELL briefly replied.

ASSOCIATION OF AMERICAN PHYSICIANS.

ANNUAL MEETING.

THE forty-second annual meeting of this Association was held at Atlantic City, N.J., on May 3rd and 4th. Owing to the illness of the President, Dr. C. H. HOOVER, the chair was taken by the Vice-President, Dr. A. S. WARTHIN.

Among the communications submitted were the following:—

Dr. JOSEPH CAPPS (Chicago) read a paper on the

Sensibility to Pain of the Pericardium.

There is, he said, an impression that pain is the most characteristic symptom of pericarditis, but Mackenzie was impressed by the absence of pain in pericarditis without traces of pleurisy. When pain exists it may be dull or sharp; it may be localised or radiate to the shoulder or abdomen. In order to investigate the underlying conditions experimental methods were tried. We used cases with paracentesis and touched the serous pericardium and sac round the heart through the fourth interspace; this caused no pain. When entry was made through the fifth interspace there was pain in the phrenic nerve region of the neck. Four clinical groups were studied: (1) pericarditis with effusion, (2) dry, (3) cases with coronary thrombosis, (4) with pleurisy. In the first group, even with large effusion, there was no pain or respiratory distress. The second type, dry terminal pericarditis, had no pain or distress. The patient died in 36 hours. There was no pain with coronary thrombosis. In pleuro-pericarditis there was sharp pain at the end of inspiration, also pain in shoulder. From an experimental standpoint, therefore, we have been unable to elicit pain from irritation of the serous sac of the pericardium and sheath of the heart. The only pain elicited was by irritation of the phrenic nerve supply through the fifth interspace, which radiated to the neck. Large pericardial effusion caused respiratory distress, but no pain. Pleuro-pericarditis caused sharp pain increased by expiration.

Dr. L. G. ROWNTREE (Rochester, Minn.) contributed studies in

Experimental Thrombosis.

Six or seven per cent. of the surgical deaths in Rochester, he said, are due to pulmonary embolism. We have tried to study this phenomenon by experimental methods, with a view to devising an effective régime for its prevention. We used experimentally a tube with a dialysing membrane, which is put into the vein and the blood flows through without contact with the air. By means of our apparatus we can slow the stream or make it rapid; we can apply heat or cold or chemical substances; we can produce pathological conditions; and we can study extracorporeally thromboses which occur in vivo. We can study what is going on in the tube. We find heat hastens coagulation time and cold retards it. To prevent clotting we used heparin, which is an antiprothrombin. Coagulation is much delayed thereby and clots form slowly, but there is no thrombosis. In jaundiced animals there was great formation of white thrombi but no fibrin. With many platelets, and without fibrin formation, the blood continued to circulate. Thus it is possible to prevent fibrin formation.

Dr. EUGENE S. KILGORE (San Francisco) gave the following communication on

Polycythæmia in Feather Dyers.

In July, 1919, there died in the University of California Hospital a German feather dyer (Mr. C. M.), aged 61, who showed clinically a high red count (up to 8,000,000), considerable cyanosis of nose and ears, palpable spleen, some fibrosis of the apex of the right lung, and, terminally, severe substernal and precordial pain, and on autopsy erythroblastic hyperplasia of marrow of long bones, coronary thrombosis, chronic myocarditis, splenic and renal embolism, and fibrous tuberculosis of the right apex. Two years previously the cyanosis and other physical features were the same, but the blood findings were not remarkable (4,416,000 red blood corpuscles). Before his death there came to visit him his assistant in feather-dyeing, Miss M. D., aged 39, who we then learned had been previously seen by Hurwitz and Falconer and as having polycythæmia. She gave them her occupation as milliner, so contact with chemicals was not stated. Her red cells at one time were 12,400,000. She improved following irradiation and benzene treatments. Hurwitz and Falconer reported her symptoms of dizziness, &c., as we now learn, from about the time she began dyeing, and her improvement corresponded not only with treatment but with her occupation becoming intermittent. After nine years it has ceased, and she is in excellent health with normal blood count. Owing to changes in fashion only one feather dyer remains in active work in San Francisco, a middle-aged Japanese man. He has 70 per cent. hæmoglobin (Tallquist)—6,040,000 red and 7800 whites. Feather dyers appear to be more exposed than cloth dyers to atmospheric spraying of the chemicals, as they shake the feathers on removing them from the dye-bath. Records of 12 cases of polycythæmia are recorded in the University of California Hospital since 1913—four attributable to congenital heart disease, one to emphysema, one to tricuspid disease. Two are the feather dyers referred to above, one a man who for many years dyed his hair black, the other three cases have had no dye contact, but the finding of a red count of 6,000,000 in the only surviving feather dyer in San Francisco makes it necessary to regard chemical contacts as more than coincidental. A. Hamilton (Industrial Poisons in the United States) reviews reports of workers, exposed to carbon monoxide, methyl alcohol, and ether in whom polycythæmia was noted. Malden reported 6 out of 13 workers in aniline fumes with blood counts over 5,000,000. The highest was 5,680,000. The increased concentration of red cells in all these cases has been regarded in a general way as due to primary destructive action of the poisons, with secondary stimulation of erythroblastic elements. Evidently, however, the study of dyestuffs in this connexion must be carried further. Feather dyers used mainly coal-tar derivatives. If the aniline series was responsible for the blood changes it is possible that different members of the series are not equally effective, and it is possible that the increased cell production is not simply a secondary effect of long-continued destructive action, but a primary or predominant effect of one or more of the substances, and that therapeutic use of them might be obtained.

Dr. ALBERT E. TAUSSIG (St. Louis) spoke on

Diabetes Mellitus Refractory to Insulin,

reporting cases unresponsive to doses of insulin. It has been suggested, he said, that this is not pancreatic diabetes. A patient in the Jewish Hospital, St. Louis, in 1922 had a progressively severe diabetes and showed urticaria after injections of insulin. She went into diabetic coma and enormous doses of insulin were given without making her sugar-free. One day she had 1100 units of insulin. In patients who showed little or no drop after intravenous injections hypodermic injections were tried with no better result, nor were fractional doses of 20 units hourly more successful. After two months the response to insulin showed improvement and finally it was possible to give a daily dose of 200 units. Finally the insulin was brought down to 104 units daily. The woman is able to work as a teacher. To find the reason for this refractory condition 10 c.cm. of the patient's blood were injected into rabbits, but there was no result. Tests for an allergic skin reaction gave no result; there was no trace of insulin in the urine. The theory that insulin acts as a co-ferment, transforming blood-sugar into glycogen or lactic acid, was considered. In some persons the other constituent (muscle phosphate) may

be lacking or may be present in too small amounts, so that insulin is not able to do its work.

DR. F. M. ALLEN (Morristown, N.J.) described

Myrtillin, a Diabetic Remedy Orally Administered.

He stated that a wide variety of vegetable substances have been tried in diabetes. Myrtillin has given varying results in dogs. There are two substances present in association: (1) myrtillin, which lowers blood-sugar; (2) a substance which raises it. These two substances occur in all plants and belong to the anabolic-catabolic activities of plants. If myrtillin is effective at all it is as effective in doses of 1 g. per day as in doses of 30 g. The effect is to stabilise blood-sugar reactions when administered orally. Myrtillin is standardised by reactions in dogs. The results are the same when given by mouth or by vein, the effect lasting for days or even weeks. The effects in dogs can be duplicated in patients with mild diabetes, but cannot be demonstrated in the rabbit or the rat. Experiments on dogs show that these animals cannot survive depancreatisation more than a week; functions are depressed, resistance lowered, infections cannot be cured, wounds do not heal. When myrtillin is used, started one day before operation, pancreatectomy is performed, and the animals are then fed on meat, milk, and bread, they hold their weight and maintain strength. They play and fight, and seem lively, the wound heals, and minor infections are overcome. The myrtillin-treated dogs are generally superior to insulin-treated dogs. Life can be maintained for some weeks or indefinitely. The experiment of partial pancreatectomy is better because it resembles human diabetes. With nine-tenths of the pancreas removed there is severe diabetes, which can be controlled by myrtillin. If only one-fiftieth of the pancreas is left the animals cannot survive even with myrtillin. Autopsy shows hypertrophy of the pancreas remnant. The first step in therapy is to make the urine and blood normal with insulin or diet, and then to give myrtillin and then watch for gradual building up of tolerance. It is necessary to use patients who have been studied over a number of years to guard against spontaneous gain in tolerance. In a series of 81 this condition excluded 24 patients, and of the remaining 57 21 were failures, 36 were positively benefited, 6 patients had never received insulin, and 15 patients were able to reduce insulin and increase diet. The remaining six patients were able to discontinue insulin.

Conclusions.—Myrtillin can be administered orally. It is harmless. It builds up tolerance. On the other hand, it is less prompt, less powerful, and less certain than insulin. It has a certain number of failures. The method deserves clinical trial, but should not be considered as a substitute for insulin.

DR. JOHN F. ANERSON (Washington, D. C.) spoke in confirmation of Dr. Allen's results. He said that the work was begun in 1926. Myrtillin was prepared from blueberry leaves, extracted by 6 per cent. alcohol solution, and the protein removed by further precipitation. A clear filtrate contains the preparation, which is a yellowish white powder freely soluble in water. It contains traces of sulphate of ammonium chloride, iron, magnesium, calcium, sodium. In the experiments were used (1) normal dogs, plus myrtillin, plus glucose; (2) totally depancreatised dogs, without myrtillin; (3) totally depancreatised dogs, with ten days of myrtillin. In the first experiments were got normal curves for individual dogs. Blood samples were taken, then 1 g. myrtillin was given, followed by 10 g. glucose per kilo body-weight. Thirty-eight dogs were studied. The administration of myrtillin before glucose prevented a sharp rise in blood-sugar. The result persisted for 15 days with gradually lessening effect. The blood-sugar later returned to normal after myrtillin. The results in the total pancreatectomy were: myrtillin 24 hours after operation; 1 g. myrtillin every morning; 200–500 g. meat, 20 g. white bread. Result: loss of weight until death, temperature normal, blood-sugar 200 to 300 mg. per 100 c.cm., at death 400 mg. The animals were lively, hungry, had no excessive thirst; duration of life 21 to 61 days. In the third experiment 1 g. myrtillin by mouth was given ten days before operation; four dogs were used and survived 21–48 days. The results were the same as in the previous operation. In the fourth experiment without insulin or myrtillin the animals died in a few days and wounds did not heal.

In regard to the clinical side of the work 16 patients with long-standing diabetes and under care of physicians were studied. In two cases there was remarkable improvement; one showed no benefit; in two patients on insulin the amount of insulin was decreased (60 units to 20 and 20 units to 5). These results were corroborated by another physician. One patient had influenza and had to increase insulin temporarily, but later was able to reduce the amount again.

DR. J. C. MEAKINS (Montreal) discussed the

Reaction of Chronic Nephrosis to Thyroid and Parathyroid Medication.

Improvement has been noted, he said, in nephrosis as a response to thyroid and parathyroid medication. The effect is due to the readjustment of the calcium metabolism which has been studied. In a woman, aged 33, with recurrent attacks of œdema which was resistant to diuretics, the patient was put on thyroid medication with good result. The urine contained casts and red cells. The urea was normal. The blood calcium was low. Put on parathyroid extract, 50 units a day, there was a prompt increase in serum calcium, marked increase in urine output, and drop in weight. When the parathyroid was stopped the œdema returned. In another case, a girl with œdema and ascites, and a reverse of the albumin globulin ratio, there was an increase in blood cholesterin, the blood calcium being low. There was no response until the eighth day. This was a case of mixed glomerular nephritis with nephrosis. In another case a man, aged 24, with œdema, the parathyroid had no effect on the weight. With high protein diet there was response in weight, but none in the plasma protein. A drop in weight followed thyroid medication. The cholesterin in the blood dropped. There is evidently an endocrine imbalance in these cases which varies in different patients; sometimes thyroid is effective, sometimes parathyroid. Sometimes it is not due to calcium disturbance. The plasma proteins may not be changed. We must look elsewhere than the colloids of the blood for explanation of an œdema which is refractory.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

AT a recent meeting of this Society, held at Sheffield, with DR. CARLTON OLDFIELD in the chair,

MISS FRANCES IVENS (Liverpool) read a paper on

LATENT SEPSIS AS A FACTOR IN THE ÆTIOLOGY OF THE TOXÆMIAS OF PREGNANCY.

Previously,[1] Miss Ivens said, she had drawn attention to the association of latent infection with the œdema and albuminuria of pregnancy, the occurrence of which was, she thought, an indication for the bacteriological examination of the urine, even in the absence of urinary symptoms. The toxæmias of pregnancy—œdema, albuminuria, hyperemesis, accidental hæmorrhage, jaundice, and eclampsia—were closely allied, and a common factor was present in all. Biochemical research had been disappointing and a bacterial origin appeared to be most probable. A series of cases investigated had been classified into four groups:—

(A) Albuminuria and Œdema.

Thirteen pregnant women with these symptoms were under care during the last two years at the Liverpool Maternity Home. In these cases the presence of coliform organisms with pus, and some-

[1] Brit. Med. Jour., 1925, i., 589.

times blood, was demonstrated in the urine. The patients were treated by rest in bed, rectal salines, calomel, saline purgatives, and potassium citrate in large doses. Only one patient, who was allowed to go home before delivery, had a stillborn child.

In 21 cases examined bacteriologically at Crofton Hospital 7 cases showed *Bacillus coli*, 2 a non-hæmolytic streptococcus, and 11 *Staphylococcus albus*, whilst in one the urine was sterile.

(*B*) *Hyperemesis Gravidarum.*

CASE 1.—A primipara vomited constantly throughout her pregnancy. The urine contained albumin, red cells, pus cells, and coliform bacilli. In addition there was an abscess of Skene's glands. The temperature was 101° F. and the pulse-rate 130. Rectal salines and potassium citrate were given in large doses and 10 c.cm. anti-coli serum were also given. A premature infant was born and lived 16 hours. The vomiting continued after delivery, with raised temperature and pulse. After vaccine treatment the patient was discharged in three months with the urine practically normal and the general condition excellent.

CASE 2.—A 2-para had had vomiting throughout her first pregnancy and had been prematurely delivered of a child, which died on the fourth day. In the second pregnancy she was well for the first three months. She then vomited incessantly. On admission the temperature was 99·8° F. and the pulse-rate 110. The patient became comatose and the vomit hæmorrhagic. The urine contained albumin, coliform organisms, and acetone and diacetic acid. A Cæsarean section was done at 26 weeks, owing to her serious condition. She quickly recovered.

(*C*) *Jaundice.*

CASE 3.—A 3-gravida was admitted with vomiting, jaundice, and retention of urine at eight months gestation. The urine contained pus, bile, and *B. coli*. After treatment with purgatives, potassium citrate, and salines improvement was marked. Labour started with excessive bleeding, but the child was born alive, though jaundiced. Rigors followed delivery with an attack of right-sided pyelonephritis. On discharge the urine was normal. It was probable that in this case, in addition to infection of the urinary tract, infection had spread to the biliary passages.

CASE 4.—A 6-gravida always vomited severely during pregnancy. Five days before confinement she vomited blood-stained material. On admission she was jaundiced; the temperature was 97° F. and the pulse-rate 120. The urine contained albumin, pus, coliform bacilli, acetone, and bile. A blood culture was sterile. A macerated fœtus was delivered after internal version for transverse lie and prolapsed cord. 10 c.cm. of antistreptococcal serum was given and rectal salines. She was quite well on discharge from hospital in a fortnight's time.

(*D*) *Accidental Hæmorrhage.*

CASE 5.—3-gravida. A Cæsarean section was performed in 1924 for contracted pelvis. In 1926 she was delivered by Cæsarean section for severe antepartum hæmorrhage. There was blood-stained fluid in the peritoneal cavity. There were hæmorrhages into the wall of the uterus. The child was dead. The urine contained a trace of albumin, coliform organisms, and streptococci. Coliform organisms were cultivated from the placenta. In 1927 a third Cæsarean section was performed. The urine was normal and the patient appeared perfectly healthy.

CASE 6.—A 5-gravida. The first three pregnancies and deliveries were normal. In labour with the fourth child there was concealed accidental hæmorrhage. She was delivered of a dead child by Cæsarean section. There was hæmorrhage into the wall of the uterus. The urine contained pus and coliform bacilli. With her last pregnancy in 1925 labour was premature. She had œdema and vomiting for five weeks previously. The urine contained albumin, coliform organisms, and streptococci. The placenta showed areas of white infarction and round-celled infiltration.

CASE 7.—A 6-gravida delivered by Cæsarean section, for placenta prævia, of a child, weight 4 lb. 5 oz. Hæmolytic streptococci and staphylococci were found in the wound. The urine contained a trace of albumin and staphylococci. The child died on the fifth day after hæmorrhage from the mouth and nose.

CASE 8.—An 8-gravida was admitted almost moribund with antepartum hæmorrhage. High forceps delivery of a macerated fœtus. The patient died soon after delivery. Cultures from the placenta grew coliform bacilli and streptococci. No urine was obtainable for examination.

CASE 9.—A 7-gravida was admitted with concealed accidental hæmorrhage and Cæsarean section was performed. There was blood-stained fluid in the peritoneal cavity and the uterus showed intramural hæmorrhages. The child was dead and the patient died immediately after operation. The urine contained albumin, staphylococci, and streptococci. The placenta gave growths of *S. albus* and non-hæmolytic streptococcus. A varicose ulcer on the patient's leg contained *S. albus*. The maternal liver showed hyaline thrombi. The kidneys contained hyaline thrombi with areas of coagulation-necrosis, and the uterine muscle stained badly, showing presence of hæmorrhages.

In conclusion, Miss Ivens said that she had hoped to stimulate interest in the bacteriological investigation of similar cases, for she was convinced that latent and autogenous infection played a great part in the ætiology of the toxæmias of pregnancy, especially where there was lowered resistance during pregnancy and where patients were delivered with trauma. She considered it necessary to obtain a full life-history of these patients, and to look for evidence of foci of infection in the throat, gums, and elsewhere.

She was indebted to Prof. J. M. Beattie, Dr. L. S. Ashcroft, and others who had assisted in the bacteriological investigation.

Discussion.

The CHAIRMAN said that urinary infections were very commonly associated with albuminuria. There was a danger of assuming, when organisms were present, that they were the cause, when in reality they were the result, of a certain pathological condition. He still was of the opinion that hyperemesis gravidarum was not due to a toxæmia.

Mr. A. GOUGH (Leeds) said that it was not sufficiently realised by practitioners how often the genito-urinary tract was infected. In 100 gynæcological cases examined bacteriologically by him cultures of bacteria were grown in 70, of which 10 were growths of *B. coli*. He explained the preponderance of infection by *B. coli* by the fact that it was a mobile organism capable of swimming up-stream, and able to proliferate rapidly.

Mr. J. E. STACEY said that at the Jessop Hospital, Sheffield, they had been struck with the number of cases of morbidity during the puerperium in patients with albuminuria during pregnancy and labour.

Dr. S. B. HERD (Liverpool) asked if there was any definite association in Miss Ivens's cases between sepsis during pregnancy and morbidity during labour and the puerperium.

In reply, Miss IVENS said that she had noticed that patients with latent sepsis did not do so well in the puerperium as others did.

EXHIBITION OF CASES.

Dr. HERD described a case of pregnancy complicated by

Necrobiotic Fibromyoma and Accidental Hæmorrhage.

The patient, a primigravida, was first examined when 12 weeks pregnant, and a soft non-tender swelling was noticed high up on the right side of the uterus. This was diagnosed as a subserous fibroid. At 17 weeks the patient had acute dysuria and a feeling of great pressure in the vagina and region of the symphysis pubis. On examination the uterus was felt to be displaced by a hard, tender mass fixed in the right side of the pelvis. A diagnosis of degeneration of the fibroid was made.

As it was impossible to move the tumour under anæsthesia the abdomen was opened and a degenerated fibroid was removed from the uterine wall just above the right utero-sacral ligament with some difficulty and not without a great deal of manipulation of the body of the uterus. No other fibroids were present. The patient was kept under morphia for a few days to diminish the chances of abortion, and this treatment succeeded. On the fifth day there was thrombosis in the right leg, which was believed to be due to lack of the exercises which had been ordered.

She remained quite well until 32 weeks gestation, when she developed a violent headache. On the next day the perception of fœtal movements ceased and she had slight œdema. Two days later there was marked œdema and albumin 16 g. per litre in the urine. The fœtal heart sounds were heard on that day. Two days later there was sudden onset of pain and vaginal hæmorrhage; morphia was administered. Three days later a slightly macerated fœtus was delivered. The puerperium was normal.

The special points in this case, said Dr. Herd, were the persistence of the pregnancy after marked

manipulation of the uterus, the supervention of toxæmia followed by accidental hæmorrhage, and the fact that the fœtal heart was heard for three days after the perception of movements had been lost.

The PRESIDENT said that he did not think that the lack of exercises should be blamed for the thrombosis. He suggested that the necrobiosis in the fibroid had produced toxæmia in the first place, causing a retro-placental clot which led to placental changes which later gave rise to albuminuria and accidental hæmorrhage.—Dr. E. O. CROFT (Leeds) said that it was surprising how much manipulation a pregnant uterus would stand without aborting, and recalled a similar case of myomectomy.—Mr. J. E. STACEY asked what would have happened if operation had not been performed. He had seen a case of pregnancy with a large fibroid in the fundus in which there had been symptoms at seven months gestation. It was treated expectantly and settled down. The patient had a placenta prævia, and the child was stillborn. On the ninth day of the puerperium symptoms again arose, and myomectomy was successfully performed.—Miss IVENS recalled a case which three weeks before term induction was attempted by bougie for a contracted pelvis. Introduction of a bougie produced severe bleeding and it was withdrawn. At term Cæsarean section was performed and a large retro-placental clot was found. There had been no albuminuria in the meantime.—Mr. W. GOUGH (Leeds) related a case in which a fibroid the size of a hazel nut gave rise to such severe pain during pregnancy that operative treatment had to be undertaken. Myomectomy cured the condition.

Dr. HERD, in reply, said that there was an interval of 14 weeks between the operation of myomectomy and the onset of the albuminuria; he submitted that this was too long for the albuminuria to be due either to the necrobiosis or to retroplacental clot caused by the manipulation of the uterus. In this case the position of the degenerated fibroid would have obstructed labour even at the early period of 18 weeks gestation, so operation had been essential.

Mr. A. GOUGH (Leeds) described a case of

Pelvic Myxoma.

The patient, aged 35, was a multipara. She had noticed a swelling in the left gluteal region at least 12 years previously, and others had later formed in the abdomen, perineum, and vulva. Four operations had been performed between 1915 and 1924, during one of which the large gut had been damaged, necessitating a colostomy which only closed several months later. Menstruation was normal and the functions of the bladder and rectum were unimpaired.

There was a mass filling the left lower quadrant of the abdomen. The tumour could be traced over the pubis to the left labium majus, where it formed a huge pedunculated mass hanging down nearly as far as the knees. The circumference was 5½ in. in the upper part and 22 in. at the lower end; the total length from the pubes was 11 in. The overlying skin was thinned and purplish. The tumour could be traced backwards into the left buttock, where there was a mass the size of an adult head. The tumour was painless and felt spongy and elastic with some coarse lobulation. Vaginal examination was unsatisfactory, but the left side of the pelvis was felt to be full of growth continuous with the superficial masses and displacing the vagina and rectum to the right.

Complete removal was impossible. At the first operation the pendulous portion was removed at its origin at the level of the pubes; it weighed 5 lb. 1¼ oz. Four months later the gluteal mass was removed. Cystic spaces were noted in both masses. Microscopical examination showed typical myxomatous structure. The cystic spaces were bounded by layer of condensed stroma, no epithelial lining being demonstrable.

The PRESIDENT said that it was very difficult to deal with these cases. He had operated on one of them several times. He suggested deep X ray therapy.

Mr. GOUGH said that he had discussed X ray therapy with a radiologist who had expressed the opinion that it was useless in these cases. Mr. Gough also described a case of a large solid ovarian tumour with twisted pedicle.

Mr. STACEY showed calculi removed from a case of complete procidentia.

Reviews and Notices of Books.

THE CONSERVATION OF THE FAMILY.

By PAUL POPENOE. London: Ballière, Tindall and Cox. 1926. Pp. 266. 13*s.* 6*d.*

THE reader is informed in a preface that this work is the sequel of another which was devoted to the problem of marriage as it confronts the individual in a private capacity. This book is held to supplement the first in that it is concerned with the things the individual cannot do for himself, but which it should be the duty of society to do for him. As is implied by the name, this book is eugenic in object. It is divided into four parts. In the first is described what the author holds to be the normal family—upon the conservation of which the future of America will depend. The ideal family is monogamic in constitution, and should be entered upon early in life by both parties. These should belong to strains exhibiting health, vigour, longevity, and socially valuable mental qualities. The children should number at least four, and in superior families the figure should be exceeded. In the second part of the book are described those conditions which in America interfere with the normal functioning of the family as previously described. Abundant statistics are furnished to support the contention of each chapter. Celibacy and the ascetic ideal are condemned as dysgenic. Figures indicating the prevalence of premarital incontinence, obtained from American undergraduates of both sexes, suggest that America is more fertile in material for the statistician of these subjects than this country. The breaking of homes, the frequency of which is measured by the number of divorces, is attributed in large part to the prevalence in America of the romantic ideal of love, which is held to have emanated from the Orient. To the exhaustion of this sentiment, which is expected to persist throughout conjugal life, is attributed the failure of so many marriages. Prostitution, delayed marriages, venereal diseases, infertility, abortions, inadequate reproduction among superior types, and excessive reproduction among inferior families are the subjects of separate chapters, and are held to oppose the conservation of the normal family.

The third part of the book deals with the methods of social control by which the family may be preserved. The education of adults to their parental responsibilities, and a change of public opinion with regard to childbearing and the family are the first of the necessary changes. In dealing with economic reforms, the author opposes the taxation of bachelors and childless married couples, the undiscriminating family wage, baby bounties, and maternity benefits. On the other hand, he favours a family allowance depending in magnitude upon the basal pay of the father. Thus, if an increase of 10 per cent. were made to the wages of a father of a family as each child was born, the artisan would receive a larger increment than the unskilled labourer. Such a graduated subsidy could never become a mere incentive to the socially useless members of society to multiply. It is said that this system is in effect among civil servant employees in Holland. Preferential employment for married men with children is naturally advocated; the author also propounds a scheme intended to counteract the tendency to late marriages among superior parents. It consists in an inversion of the usual method of life insurance. In the words of Dr. Noyes: "To enable picked individuals to marry earlier, why not reverse the ordinary policy of insurance in which a small sum is paid to the company for a long series of years, and at death a large sum is paid to the relation, and in its stead let the company advance the large sums first in quarterly or monthly instalments for a short series of years, decreasing gradually to nothing . . . and then let him pay into the company a small sum for a long series of years?" Lastly, the author advocates urban decentralisation, and the

migration of all who can afford it to the country and the farm.

In order to diminish the reproduction of inferior families, the author suggests that clinics be founded where the methods of contraception that are most approved should be taught. The grossly defective should be sent to farm colonies wherein the sexes are segregated, and which, under proper management, should be self-supporting. And the author would like to see courses in maternity and child welfare established for young women at American universities.

The book is marred in parts by careless writing, by a certain crudity of argument, especially evident in the selection of analogies, by which the author reduces to absurdity the contentions of his opponents, and by a tendency either to ridicule or to dismiss as unworthy of serious consideration views that do not assort with his own; but it is well-compiled, well-stocked with references to other works on kindred subjects, and is never dull.

FOOD AND THE PRINCIPLES OF DIETETICS.

Sixth edition. By ROBERT HUTCHISON, M.D., F.R.C.P., Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street. London: Edward Arnold and Co. 1927. Pp. 610. 21*s*.

THE alterations in the new edition are few but important. Some account of the sippy treatment of peptic ulcer has been added, and the sections dealing with vitamins and infant feeding have been modified. Except for minor details the remainder of the text is unchanged. This book has long been a classic in the modern science of dietetics. First published in 1900, its origin was a course of lectures delivered to students of the London Hospital. At that time the subject of dietetics was almost wholly ignored in the curriculum, and even now, though isolated facts of food metabolism and the effect of deficient diets are taught, the student who is to be a successful practitioner must gain a better working knowledge of the preparation and value of foodstuffs than he will find in text-books of physiology, hygiene, or medicine. All that he needs he will find attractively presented by Dr. Hutchison.

FORENSIC PSYCHIATRY.

An Introduction to Forensic Psychiatry in the Criminal Courts. By W. NORWOOD EAST, M.D., Medical Inspector, H.M. Prisons, England and Wales. London: J. and A. Churchill. 1927. Pp. 381. 16*s*.

MANY medical practitioners may find themselves at a disadvantage when called upon to give evidence in the criminal courts upon the issue of mental disease. The text-books on insanity and mental deficiency seldom deal with points of practice and procedure, and often the prospective witness cannot spare the time in which to search a library. For his benefit Dr. Norwood East has put on record the experience he has gained during many years' work as medical inspector of H.M. Prisons and in constant appearances in the witness-box at criminal trials. He begins with two excellent chapters on Ascertainment and on Practice and Procedure which contain much information not readily to be found elsewhere. His readers will gather useful hints on how to deal with the stock questions of the cross-examiner, and they will be prepared also for those casual questions from the Bench—not necessarily relevant to the issue, often unexpected and occasionally disconcerting, as when a medical witness is suddenly asked by the judge to express an opinion upon the sterilisation of the insane.

The chapter on Criminal Responsibility is a careful and correct summary of the history and present condition of the law. Dr. East's official experiences and associations have led him rather to bridge than to widen the gap between legal and medical opinion. Without disguising the fact that the law often seems to lag behind the progress of modern medical science, he states his conclusion that the legal tests of insanity work no hardship to the accused because the law is not strictly applied. Like the late Dr. Mercier, he finds after prolonged study of reported cases remarkably few instances in which an accused person has been convicted upon evidence which appeared to justify acquittal on the ground of insanity. Dr. East goes so far as to doubt whether alteration of the law might not result in its less elastic administration and consequently in more obvious hardship to the accused. In subsequent chapters Dr. East classifies and expounds the several types of insanity. The illustrative cases are well chosen and are aptly and scientifically stated—needless to say, without the faintest trace of sensationalism. This book is the work of an expert, writing upon a subject which he has made his own, knowing what he wants to say about it, and able to say it clearly.

DISEASES OF INFANTS AND CHILDREN.

Second edition. By J. P. CROZER GRIFFITH, M.D., and A. GRAEME MITCHELL, M.D. London and Philadelphia: W. B. Saunders Company, Ltd. 1927. In 2 volumes. Pp. 1715. £4 10*s*. per set.

THE first edition of Prof. Griffith's comprehensive work on pediatrics, which appeared in 1919, has lately been out of print, and the author has produced an enlarged and revised edition in collaboration with Prof. Graeme Mitchell of Cincinnati. The form of the original work has been retained, but new material has been incorporated throughout the text, and a number of new articles have been included, the size of each volume being somewhat increased. Among the more notable additions are new sections on encephalitis, allergy, and spasmophilia, which are of the same high standard as the older parts of the book. The chapter on infant feeding has undergone some modification, and those on rickets and congenital syphilis are greatly amplified. In general the lines of treatment followed by the author in the first edition have suffered little change. The illustrations and colour-plates are, as before, a notable feature. This book should be of the greatest assistance as a work of reference for post-graduate students, to whom its value will be much increased by the comprehensive and well-chosen list of references to original papers. This list has been brought fully up to date, and forms one of the best bibliographies available on this subject.

MODERN PRACTICE OF PEDIATRICS.

By WILLIAM PALMER LUCAS, M.D., Professor of Pediatrics, University of California. London: J. and A. Churchill. 1927. Pp. 962. 30*s*.

THE increasing attention which the study of pediatrics has claimed in recent years is evidenced by the quality as well as the quantity of the text-books which appear on this subject. Prof. Lucas's work, though it covers well-worn ground, has many distinctive features which will recommend it to the reader. It contains in one volume both a comprehensive account of the physiology and biochemistry of early life, and a clear and readable description of the clinical aspect of children's disease, with a very successful attempt to correlate the two.

The first part of the book is largely concerned with physiology and metabolism, and contains a remarkably clear account of involved problems such as arise out of the work of Finkelstein and Czerny. The second part is devoted more fully to disease, but pays special attention to the development of the child and to mental problems. The practical value of the work is increased by a chapter containing details of diagnostic and therapeutic measures, and by lists of references appended to each chapter. The latter would be of still greater assistance to the student if their precise connexion with the text were indicated by reference numbers. The volume may be recommended as an admirable text-book for senior students and practitioners.

A TEXT-BOOK OF BACTERIOLOGY FOR DENTAL STUDENTS.

By ARTHUR BULLEID, L.R.C.P., M.R.C.S., L.D.S., Assistant Dental Surgeon and Assistant Bacteriologist to Guy's Hospital. London: Heinemann. 1926. Pp. 219. 15s.

IN his preface Mr. Bulleid states that the book has expressly been termed a text-book of bacteriology for dental students rather than a text-book of dental bacteriology. The distinction is important, for while it may be conceded that the dental student does not need to know the outlines of general bacteriology in such detail as does the medical student, yet a sound knowledge of general bacteriological principles is essential if he is to be able to understand the more limited bacteriology of the mouth. Many of the books on bacteriology written for dental students fail in this respect. Either they consist of a few severely abbreviated chapters on general bacteriology with a fuller account of the flora of the mouth, or else the book is devoted exclusively to the dental aspects of the subject. The latter type of book is justified if it be regarded as an advanced book for the specialist who has already a grounding in general bacteriology, but the former type is almost useless, for it fails to emphasise the general principles essential to a grasp of the application of such problems as immunity, infection, or inoculation to dental disease. Mr. Bulleid's book steers clear of these pitfalls, the balance being maintained between the general and the special aspects of bacteriology. Indeed, the medical student may find it useful, not as a substitute for the larger text-books, but as a supplement giving a clear account of the organisms of the mouth in their relation to dental disease. The chapters on cultural methods, staining methods, susceptibility, and immunity are all excellently written and convey clearly the chief points of importance. A fuller account of the principles underlying such a phenomenon as agglutination would have been welcome. We miss any reference to Besredka's views on local immunity; the more so since this has been made the basis of a special method of bacterial therapy for pyorrhœa. The book deserves a wide success.

New Inventions.

A SIMPLE METHOD OF BLOOD TRANSFUSION.

THE use of a large glass syringe was a big step towards simplifying the technique of blood transfusion. Glass syringes, however, are fragile, they lack perfect apposition of piston and barrel, and they are necessarily limited in capacity. Their disadvantages have been overcome in the method here described.

The apparatus illustrated consists of a metal cylinder (11¾ in. long by 2 in. diameter) which holds 1 pint; and there is a metal piston, and an excentrically-placed glass and metal nozzle. Rubber tubing is incorporated between the nozzle and the needle to act as a shock absorber. The nozzle should be sterilised with alcohol, but must be thoroughly dried before use. The rest of the apparatus is boiled. The piston is smeared with a minute quantity of sterile vaseline. When the syringe and needle are assembled, 2 drachms of a sterile saturated solution of sodium citrate are drawn in through the needle and allowed to play over the whole of the interior of the syringe. The air is expelled from the syringe and the needle is inserted into the donor's vein. An assistant aspirates whilst the operator holds the needle steady. When the syringe is full the needle is withdrawn. If a larger transfusion is required the needle, with attached tubing, is left in the vein, and the nozzle of the second syringe is attached to it. Alternatively, each of the syringes may be filled with blood from different donors. The syringeful of blood will keep unclotted indefinitely, and, if it has been allowed to cool, can be warmed by immersing it in hot water.

For infusion the syringe is held vertically, and any air driven out through the glass nozzle. A small needle, fixed into one end of a piece of rubber tubing, is inserted into the recipient's vein. When the blood runs out of its free end, the tubing is connected to the nozzle. The assistant then presses the plunger, forcing the blood into the vein. Owing to the large pressure that can be obtained, needles of small bore can be used. To withdraw blood, size 15 is recommended. For infusion, size 21 suffices—the size which is used as a routine in this hospital for the administrations of N.A.B. in antisyphilitic treatment.

The following advantages are combined in this method: (1) small quantity of encipient used; (2) the blood is the whole time enclosed in a sterile container; (3) ease and quickness of sterilisation—an autoclave unnecessary; (4) elimination of multiple

"gadgets"; (5) skilled assistance is not essential; (6) transportability; (7) ease of insertion of small needle diminishes number of times vein of recipient has to be cut down on.

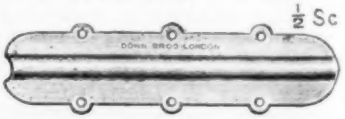
Using the Wolff's bottle method, I have had one case, seen two others, and heard of several more, in which it was necessary to expose the contracted median basilic vein of moribund patients, and it was found impossible to pump blood into the vein after the needle had been inserted. This tonic contraction is made worse by injury to the vein, and is seen only in gravely exsanguinated patients. It is hoped that it will be overcome by the increased pressure obtainable from the syringe. A series of different-sized cannulæ have been designed for the rare cases in which it is necessary to cut down on the vein. The cannulæ are fitted with stopcocks and have bulbous ends to allow of their being tied securely into the vein.

The apparatus was made for me by Messrs. Down Bros., Ltd., St. Thomas's-street, London, S.E.

R. R. MACINTOSH, M.R.C.S. Eng.,
Assistant Medical Officer, Venereal Diseases Department, Guy's Hospital.

A DEVICE FOR CUTTING PLASTER-OF-PARIS SPLINTS.

I HAVE been using with success in India for a considerable time the device illustrated here for cutting plaster-of-Paris splints applied to various parts of the body.



The advantages claimed are: (1) it is simple and can be easily and cheaply manufactured; (2) its easy applicability to any part; (3) its lightness; (4) it is very easily applied by fixing it to the jaconette or lint or any other material which envelopes the part with a few stitches before applying the plaster bandages; (5) the rapidity and ease which a plaster case can be cut by interposing one or more of the plaster saws if it is desired to cut in one or more places.

A. F. WINNINGTON DA COSTA, L.M.S. Bombay, D.T.M. Calcutta.